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ture of these engines. They are building them of all sizes. The company purchased the property so long known as the works of Merrick & Sons, where, years ago, some of the largest and finest marine machinery which was used in either the navy or the merchant service was built. During the past two years the works have been refitted and a large amount of machinery put in, with special reference to the requirements of engine building. Our illustrations are from working drawings of the largest rolling mill engine so far constructed by the company. The cylinder is 44 by 48 inches. The engine is employed in driving heavy roll-trains. The bed-

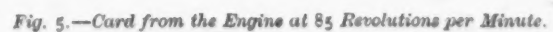


plate is of that peculiar curved pattern which was adopted in the earlier engines, and which practice has shown no reason for changing. The valve motion is of the Allen type, with the link and eccentric strap in a single piece, the exhaust and steam valves being driven independently. The engine in general may be described as belonging to the class of automatic cut-off expansion engines. All the valves have positive movements, which are given by a single eccentric. In our drawing all the parts of the valve motion are shown in the position which they occupy when the piston is at the crank end of the stroke. The opening and closing

(Continued on page 5).

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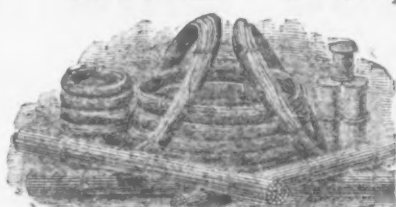
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The Production of Sound Ingots and Steel Castings.

The presence of air bubbles, so often met with in ingots and steel castings, have always been a source of considerable trouble and annoyance, and have, consequently, led to repeated experiments aiming at their removal. Several methods, such as the Whitworth and Terrenoire methods, have met with a partial success, and, as compared with these, it is stated that the invention of Mr. E. A. Krupp, of Essen, possesses peculiar advantages, justifying a short description of the same.

Mr. Krupp proposes to subject the liquid metal, when in the mold, to a considerable pressure, produced by a liquid or solid substance of such a nature as to be in the gaseous state under ordinary atmospheric pressure and temperature. Immediately after the metal has been poured into the mold, communication is established between it and a vessel containing any such substance, carbonic acid, for example, and according to the temperature to which the reservoir is exposed, and according to the properties of the substance employed, a gas pressure of any required strength may be applied to the molten metal. As the applied pressure must be regulated within limits decided upon as desired, the above-mentioned reservoir is placed in a bath of water, oil or other suitable fluid, which, by the admission of steam or water thereto, can be heated or cooled as required. The pressures, of course, depend upon the extent to which the reservoir is filled, and upon the temperatures to which the substance is exposed, and, in order to enable the pressures to be most advantageously applied, the upper part of the molten metal is kept hot as long as possible, while the ingot is gradually cooling and contracting, the upper part of the mold being provided with an interior lining of refractory material. Another method consists in covering the surface of the molten metal with a layer of liquid slag. The same object may be effected by making use of a thick cover of some practically non-conducting material. This cover is placed on the top of the metal, and the pressure is maintained until there is no further tendency to form hollows or pores in the ingot or casting.

It has been in some cases proposed to use linings of refractory material, which, practically, surround the molten metal in the mold, but the action of such material at the lower part would be disadvantageous and defeat the object of this invention, which is to provide for the pressure being applied properly; and, to enable this to be done, the molten metal is kept as hot as possible at the upper part while the lower part is gradually cooled. It may be interesting, in this connection, to note the method proposed by Dr. Henrik Tholander, of the Forsbacka Iron Works, Sweden, the molten Bessemer metal, in this case, being exposed to a vacuum, or rather to a minimum of atmospheric pressure, by which the gases contained in the metal are removed. The vacuum is to be produced in the converter itself, and for this purpose an ejector worked by a fan or jet of steam is placed in the open end. The latter may also be closed by a cover, and afterward connected with a suction fan of suitable construction. The gases which have been absorbed by the metal escape with considerable violence, and though for many reasons an article absolutely free from gases cannot be produced by means of a converter vacuum, the tension of the remaining gases is nevertheless so much reduced that they can no longer separate, but remain fully dissolved in the metal, forming no bubbles or air holes. Another advantage claimed for the vacuum process is that the red-shortness of the Bessemer metal, as far as this is occasioned by the presence of oxidized iron in the metal, is diminished, because the oxidized iron dissolves itself on account of the high temperature in the converter into metallic iron and oxygen, which latter evaporates in one or another gas formation.

Another suitable method of carrying out this invention is thus described in the London Mining Journal: The converting chamber is fitted with an ejector, and has on its upper part a disk or collar of cast iron, into which, by means of a luting consisting of fine ground quartz or "chamotte flour" (powdered brick) and clay, and by means of screw bolts, an iron ring is pressed air-tight; this ring is fastened to a sheet-iron helmet or cap, which is lined with fire-proof material. Through said dish or collar, fitting as closely as possible, the leading or guiding rod runs to a branch from a chambered interior rod, and is made hollow in order to serve as blowing pipe in the ejector, the delivery mouth-piece of which is placed in the helmet or cap covering the converting chamber precisely in the middle above the leading rod or blowing pipe, and an air pressure or steam pipe is connected to this when evacuation is to take place. The leading or guiding rod may of course also be made solid, as is the usual way, and the ejector be attached quite apart from it to the converting chamber or its cover. If a converting chamber is not used the ejector ought to be fixed with a suitable luting direct to the opening of the converter. Two more outlet mouth-pieces may be used where a strong current must be maintained, rather than to increase the delivery opening of a single ejector in a corresponding degree. On allowing the metal to issue from the converter, even if free from gases before tapping takes place, bubbles may be produced, owing to the air which is drawn into the molds by the stream of metal, this being especially the case when the fall in the open air is very high, and when the metal issues very rapidly from the tap hole. This air oxidizes the iron, and the iron thus oxidized mixing with iron turns into carbonic acid, which certainly may evaporate while the metal remains liquid in the mold, but which otherwise, at least to a certain extent, remains together in bubbles in the blooms. In order to avoid this inconvenience it is advisable to adopt the methods used in many places in regard to Bessemer metal, viz., to place a funnel or a basin over each mold, close beneath the converting chamber, in which the metal is first poured, and from which it runs down into the mold with decreased speed. This basin should so completely cover the opening of the mold that just sufficient space remains to allow the in-

closed gases to escape. In this way air is entirely excluded, only such gases being carried along to which Bessemer metal is indifferent, and which when they are in the mold are not absorbed, but immediately rise to the surface.

The Temperature of Tunnels.

Observations in shafts, mines and borings show that at a certain depth below the surface the temperature is constant all the year round. The exact law as to the increase of temperature beyond this depth is not known, it being assumed, however, that it rises from .03 to .033° C. for each additional meter (3.28 feet) of depth, and consequently increases by 1° for every 98 or 100 feet. Special circumstances, such as the influx of warm water, decomposition of gravel and feldspar, slow combustion of coal, &c., may, naturally, involve changes in certain places. Thus, in the celebrated Comstock Mines, Nevada, a temperature of 40 to 50° C. prevails at a depth of from 2000 to 2600 feet. The depth reached by mines is, however, by no means so great as the height of the mountains superincumbent upon the tunnels which pass under the Alps, or are to be made through them, and it is consequently fortunate that the above increase of temperature is not experienced in tunnels, but stands in relation to observations in plains or on mountains of medium height. The Mount Ceniz Tunnel, for example, is about 4428 feet above the sea level at the middle, and the highest part of the mountain chain below which it runs is some 5243 feet higher. The prevailing temperature there is for the air -6° C.; for the mountains -1° C.; the temperature observed in the tunnel shortly after its completion was 29½° C., making a difference from the summit to the tunnel center of 30½° C. Thus, the increase of temperature would be 1° C. to about 170 feet of depth under the mountain chain. With regard to the St. Gothard Tunnel, it may be said that the outer temperature is felt for a distance of only 6000 or 9000 feet, the temperature at greater distances depending upon the mass of the overlying rock. In the middle of the tunnel, some 3785 feet above the level of the sea, the temperature is 30½° C., and on the summit of the mountain, about 5500 feet higher, it is -1° C. M. Dubois-Reymond, who assisted in making observations in the St. Gothard Tunnel, came to the conclusion that work may be carried on just as easily in a dry atmosphere of 50° C. as in a moist atmosphere of 40° C.; those two figures forming the limits within which man is able to work for any length of time.

Suggestions for Improvement in Elevated Railways.

Now that New York has solved, and, in a measure, successfully solved the problem of elevated railways, various so-called improvements are proposed, the latest being by somebody in Chicago, who promises to overcome all objections to which the present form of road is open, by dispensing with the locomotive, each car deriving its motive power from gravitation. The proposed road is thus described by an exchange:

"The elevated track is laid with an incline, down which run neat little cars, each of which seats fourteen passengers; the car moves along with a uniform accelerated motion until it reaches the bottom of the incline, where passengers get on or off; then an elevator, similar to the freight and passenger elevators so much in vogue in large buildings, raises it to the top of the next incline, down which it runs. The trestle-work will be less in the way and less ponderous than that necessary for elevated railways where locomotives and whole trains of cars are run, similar to those now in use in New York City. The cars, when loaded, will not weigh more than 3000 pounds, while a locomotive alone weighs many tons."

This sounds very well, but the inventor, evidently, did not consider that the essential requirement for a successful application of this system is a comparatively level street, or rather a street without sudden and considerable variations of grade. It is true that this would be of little consequence if the starting points of the road were sufficiently high above the ground, or if a series of short inclines were employed. In the first case, considerable difficulties in the construction would most certainly be encountered, while, in the second case, the all-important factor of time would exert a mighty and opposing influence. The aim of elevated roads is rapid transit, and if, at comparatively short distances, such delay would occur as is necessitated by the use of elevators in transferring the cars from one incline to another, the people would soon cease to avail themselves of the doubtful benefits of the system.

Some interesting notes have been published concerning the hydraulic works for the use of the Industrial Exposition at Milan, and of the new fountain erected in that city. The total cost of the works was \$16,000. The daily supply of the fountain costs \$1.80, and the water is thrown to a height of some 87 feet, involving an expenditure of about 9 gallons of water per second. The effect is quite as striking as that of either of the other great fountains of Europe. The Berna fountain consumes about 18 gallons per second; the Trafalgar Square, 16; the Stoccarda, 15½; the Turin, 12½; each of the fountains of the Place de la Concorde, 15½; each of the Rond Point, 9; that of the Place Belle Court, 10, and that in the Place du Chateau, Brussels, 10.

The foundation of an immense steam hammer for the Union Iron and Steel Company, of Chicago, Ill., has recently been successfully cast at the car-wheel works of Mr. J. H. Bass, in that city. It weighs 30 tons, and is the largest casting ever made west of Pittsburgh. The mold was filled in exactly seven minutes.

The Neshannock Furnace, Newcastle, Pa., recently made 741 tons of pig iron in one week. The furnace has a 60-foot stack and 16-foot bosh, and the output compares favorably with some of the productions of the large Pittsburgh furnaces on Bessemer stock.

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(Continued from page 1).

motion of the valves is rapid, while their
idle travel is greatly reduced by the employ-
ment of the wrist motion first applied to slide
valves by Mr. Corliss. The exhaust valves
have a positive motion, and give a full open-
ing when the piston reaches the termination
of the stroke. This opening is maintained
till near the close of the return stroke, when
the port is closed by a rapid motion.

Figs. 2 and 3 show a longitudinal section
of the cylinder, and also a cross-section
through the valve chests. Each valve is
shown in the position which it occupies when
the piston is at the forward end of the stroke.
The exhaust valve at the upper side on the
right is shown, giving a full opening to the
steam. The steam valve in the opposite
corner is just opening. These valves are both
of them rectangular blocks of metal working
in rectangular openings, and each opening
has four passages for the admission or re-
lease of the steam. They are balanced at all
points of their stroke, since the pressure of
steam, and even the pressure of the flow
of steam, comes upon them in all direc-
tions, and is consequently equalized. The
method of keeping the steam valve tight is
most beautifully worked out, and operates
perfectly, not only at all temperatures, but
for any amount of wear that can come
upon the valve. Actually, the only wear
that is possible is that due to the insignificant
weight of the valve upon its lower edge,
which is so small as to be practically of no
importance. The "pressure plate," as it is
called, forms one side of the opening in
which the valve works, and while touching
it, rests on inclined seats shown in cross-section,
Fig. 2, relieving the valve of all pressure.
It is moved up or down by turning the bolt on
which it is supported. When it is moved
up it is forced away from the valves; when
it is moved down the steam pressure closes
it against the valve. The exhaust valve
is very peculiar in its arrangement, and
is so filled at the back by its outside
casings that, though the pressure upon it is
outward, there is no waste room save a
small portion of that actually needed for
the movement of the valve. This is a
result, we think, not before obtained with
a plain sliding valve. The steam ports
are 18 inches long by 4 inches wide, while
the exhaust ports are 5 inches in width and
22 1/2 inches long. The latter are so placed
that they completely drain the cylinder.
Both cylinder covers are chambered out.
The stroke is 48 inches, and the diam-
eter of the cylinder 44. The length be-
tween the cylinder heads is 5 feet and
1/2-inch, while the length over all is 7 feet
5 1/2 inches. The walls are 1 1/2 inches in
thickness, and the heads from inside to out
about 16 inches. Fig. 4 shows the connect-
ing rod in detail. It is exceedingly heavy,
being 9 1/2 inches deep at the crank-pin end,
and 5 at the cross-head. The form is, we
think, identical with that first used. The
crank-pin end having no straps, but being
slotted out to take the brasses, which are ad-
justed by a wedge held by a couple of screws.
The cross-head end has the usual gib and
key. The pin, which is flattened, is 7 1/2 x 6
inches. The main pin is 9 inches in diam-
eter by 8 inches long. To save overhang as
much as possible, the rod is given the least
possible clearance with the disk, and the
brass is overhung, if the term may be used,
to the extent of an inch, which reduces the
overhang of the pin to the same extent. Its
length over all is 13 feet 6 inches. It is 12
feet, or three times the length of the stroke,
between centers. The slotted form of the
end caused much comment when it first ap-
peared, but long use has demonstrated that
it is very desirable, and the same plan has
been repeatedly adopted by engineers when
practicable.

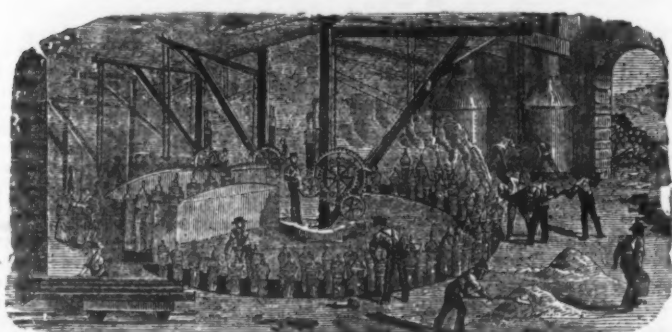
The accompanying indicator cards were
taken from a 40 by 48 Porter-Allen engine
at the Otis Iron and Steel Co., Cleveland,
Ohio, by Mr. S. T. Wellman, in October and
November, of last year. The scale is 40 for
both cards. The first of these, Fig. 4, was
taken with the gauge at 77 pounds and the
engine making 90 revolutions per minute.
The cut-off line marked x is worthy of
notice, as the valves practically cut off the
steam instantly, without allowing the initial
pressure to rise more than a pound or two
above that due to compression. The expan-
sion curve, of course, falls far below the
atmospheric line. A curious fact may be noted
here. The pressure, of course, rises as the ex-
haust valves open, but instead of no back
pressure, as in the cards when the steam fol-
lows for a considerable distance, there is a
strong back pressure for some little distance.
This results from the necessity of reversing
the current of steam in the exhaust pipe.
When the valve opens, the steam rushes
toward and into the cylinder, instead of away
from it, and this causes the back pressure
line to rise, and it remains some distance
above the atmospheric line till near the close
of the return stroke. This is more plainly
shown in the second card, Fig. 5, when the
normal back pressure is almost nothing. In
the second card the steam pressure was
70 pounds and the speed of the engine
85 per minute. The cut-off is very per-
fectly controlled by the governor, a fact
that is shown not only by the wide variations
in the point of cutting off, but also by the
fact that, when the work is sensibly uni-
form, the cutting off is also uniform, and
the cards at successive revolutions are iden-
tical. The point of cutting off varies from
nothing to about three-eighths of the stroke,
the speed being so uniform that its changes
are not perceptible—except, perhaps, to an
expert.

An apparatus for the determination of
melting points has been described by Mr. C.
F. Cross and Mr. E. J. Bevan. It consists of
a small platform of thin ferrotypic iron or
silver, having an opening for the reception
of a thermometer bulb, and a small inden-
tation or depression. A very small quantity
of the substance is melted in the little depres-
sion, and, while still liquid, a thin platinum
wire, bent like an L and fused in a glass
float, is immersed in the liquid and held there
until the substance solidifies. A thermometer
is then inserted in the opening and the whole
apparatus plunged under mercury, which is
gently heated, and the thermometer mean-
while is carefully watched. When the sub-
stance melts the float rises instantly, and the
temperature is noted.

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Flange Pipes.



General Foundry Work.

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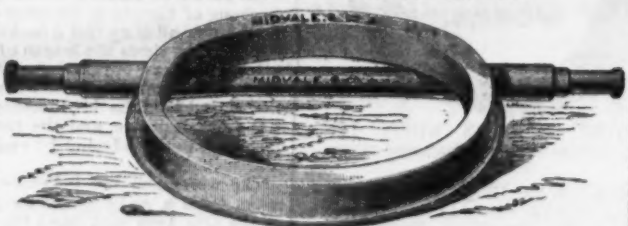
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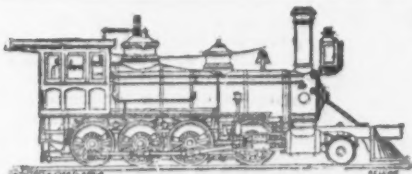
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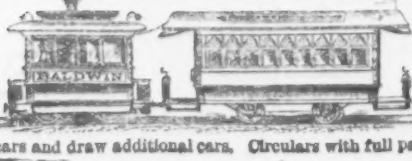
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The Bronze Age of Britain.

The above was the subject of a lecture recently delivered in Birmingham, England, by Dr. John Evans, the period referred to being that when iron and steel were practically unknown in England, and when cutting tools, weapons, &c., were made of bronze. It was stated that the existence of such a period did not rest merely upon the fact that a large number of bronze implements were often found unassociated with iron articles, though occasionally with some of flint, but it was also to be found in the pages of early history. The existence of a bronze age to a certain extent implied that in some part of the world there existed a copper age, and the nearest approach to a copper age prevailed in Wisconsin and other parts of North America, where native copper was found in large quantities. In those districts a considerable number of the iron implements were hammered out of the copper. The discovery of bronze was made in America as well as in the old country, bronze being a mixture of tin with copper, and used for the purpose of producing implements which should be superior in quality to copper implements, and also more readily produced. In Peru bronze implements were found, made as nearly as possible of the same proportions of tin and copper as those manufactured in Europe, the favorite proportion being about nine of copper to one of tin. The proportions, however, varied, partly, no doubt, owing to the temporary want of one or other of the metals, and partly with a view of producing a harder metal for certain purposes. Although bronze, as a rule, contained no lead or zinc, the former metal was found in small proportions in several articles coming from Scotland and Ireland. Profiting by past experiences, the people soon learned that lead in small quantities might be successfully used for articles not intended for cutting purposes, being, moreover, much cheaper than tin. In some cases, especially in the northwest of France, as great a proportion as 33 per cent. of lead was sometimes used in bronze, and some discoveries had been made wherein it was found that implements supposed to be bronze had been made wholly of lead. There is some difficulty in regard to the date to be assigned to the bronze age. Iron swords were in use in Gaul not later than the fourth or fifth centuries before Christ, and therefore they were most probably known in Britain. Judging by the different shapes of bronze implements which have been found from time to time, the bronze period seems to have been, without doubt, of no inconsiderable duration, having commenced probably about 1200 B. C., and continued as far as 400 B. C.

The Mineral Wealth of Virginia.

A recent issue of the *Bulletin* of the American Iron and Steel Association contained highly interesting and valuable tables of the details of the production of pig iron in the United States during the years 1879, 1880 and 1881. An examination revealed the fact that the increase in production in Virginia during 1880 over 1879 amounted to about 60 per cent., and the gain in 1881 over 1880 was about 180 per cent. This was by far the greatest percentage of increase shown by any State in the Union. The condition of the blast furnaces on the 31st of December, 1880 and 1881, may be estimated from the following figures, giving the number of stacks in blast and out of blast:

	In blast.	Out of blast.	Total.
Dec. 31, 1880.....	13	24	37
Dec. 31, 1881.....	15	25	40

The following items relating to Virginia's enterprise and activity will also be of interest:
Furnaces built in 1881: 5
Furnaces building in 1881: 2
Furnaces abandoned in 1881: 2
Judging by the zeal now exhibited in opening mines and constructing furnaces, it seems certain that the increase of production shown during the past year will continue for a number of years yet to come. The New River Branch of the Norfolk and Western Railroad Company will provide iron producers with an abundant supply of coke of the best quality, and the outlook is encouraging in every respect. The following analyses of bituminous coal from the Flat Top Region, along the line of the New River Road, were made by Messrs. Booth, Garrett & Blair, of Philadelphia. The samples were taken from outcrops. The Nelson vein, now being opened by the Southwest Virginia Improvement Company, is 12 feet in thickness, of clear coal:

	Crockett's coal. Per-centage.	Nelson's coal. Per-centage.	Coal Creek outcrop. Per-centage.
Moisture.....	0.054	1.255	0.850
Volatile matter.....	26.130	20.175	20.630
Fixed carbon.....	70.583	77.675	72.750
Ash.....	2.913	0.805	5.770
Coke.....	72.910	78.570	78.520
Sulphur.....	0.669		
Ash in 100 parts coke.....	2.788		

Analyses of bituminous coal from the same locality were made in Pittsburgh, the numbers in the table below corresponding with those of the beds in the Crane Creek section. The samples were taken from shallow openings; No. X, the constituents of which are also given, is the average standard of Pennsylvania coking coal. It is stated that the amount of sulphur is probably higher in the Crane Creek samples than it will be when the mines are driven further in:

	No. 4.	No. 9.	No. 8.	No. 1.	No. 3.	No. X.
Carbon.....	78.300	75.600	78.600	78.000	75.600	64.750
Water & vol. matter.....	18.200	20.200	18.200	18.500	18.200	27.500
Sulphur.....	1.400	1.100	1.450	1.550	1.450	3.300
Ash.....	2.800	3.600	2.400	2.700	2.400	6.310

Samples of iron ore from districts along the line of the New River Railroad were analyzed for Mr. E. T. Steel, of the Southwest Virginia Improvement Company, and, according to the statement of Messrs. Booth, Garrett & Blair, all these ores may be used for the manufacture of Bessemer pig iron. The following results were obtained:

Mark.	Percentage of met. iron.	Percentage of phosphorus.	Percentage of sulphur.
No. 1.....	59.530	0.019	0.200
No. 2.....	51.550	0.059	0.276
No. 3.....	61.301	0.013	0.048
No. 4.....	50.917	0.018	0.148
No. 5.....	66.223	0.006	None.

Another set of analyses were made of the same ores, Nos. 1 to 7 being the results obtained by Messrs. Booth, Garrett & Blair, and No. 8 giving the results of the analysis made by Professor Genth, of the University of Pennsylvania.

Location of ore.	General character.	Percentage of metallic iron.	Percentage of phosphorus.
1. Pack's.....	Compact red hematite.	64.34	0.028
2. Chapman's.....	Compact red hematite.	64.95	0.027
3. Seldon's.....	Slightly magnetic.	66.09	0.017
4. Buckeye.....	Red hematite, siliceous.	43.80	0.045
5. Doeth.....	Mag. oxide, siliceous.	55.69	0.026
6. Laurel Creek.....	Brown hematite, con't.	57.80	0.066
7. Wolf Creek.....	Brown ore.	54.96	0.249
8. Johnson's plan-tation.....		70.238	0.050

It will be seen that an abundant supply of ores of the best character exists in this part of the State, and, with cheap fuel, iron can be produced at prices that will pay a profit, when at other points a higher cost of ores and fuel would forbid production. Furnaces established here can continue to run, and at a considerable profit, when others less favorably situated must suspend operations.

Utilization of the Refuse of Mines.

The *London Mining Journal* states that there is good ground for believing that a large percentage of what may be termed refuse, brought out of mines in raising materials or metals, could be converted into profitable material, having at the same time the effect of keeping the surface from being encumbered with unsightly deposits. One colliery company have succeeded in extracting gas oil from shale taken from coal at the pit bank, and are now lighting up part of the surface premises with it. Bricks of excellent quality are made from the refuse at several places, and at some mines in different parts of England brick-making machines constitute a portion of the plant, some of them turning out from 10,000 to 12,000 per day. Yet at many mines thousands of ordinary bricks are bought for the necessary underground work, while hundreds of tons of debris, which could be easily ground up and made into good bricks, are left on the surface, occupying ground that could be made valuable. The material brought out of most mines has some properties that could be profitably utilized, even the crystalline slates and schists of the Devonian system, so rich in minerals. At some places the refuse is now ground up into fine cement, suitable for almost any purpose. Were every mine of any size to have a brick making and grinding machine the advantage would soon be apparent in a considerable saving in working cost. The olivite rocks, in particular, in connection with which such vast quantities of ironstone are now raised, have also material connected with them that would pay for selecting. In the lower olivites of some counties of England, cornbrash marble, Bradford clay, slate, &c., are found, and in the upper olivites there is not only the finer Portland stone now being extensively worked, but another valuable product called Kimmeridge clay. The area of ground over which this deposit extends is not defined, but as it appears to be a true member of the upper olivite it should cover a large area. The clay is an argillaceous deposit, and in many places has been found several hundreds of feet thick, and with many typical fossils. It is a sort of a bituminous shale, and contains in a high degree the properties of coal, giving the same products such as gas tar, from which paraffine and so many other things are obtainable, as well as a large quantity of illuminating gas. Indeed, from a ton of it upward of 9000 feet of tolerably good gas have been obtained. From what has been said it will be evident that a great deal of what is looked upon as waste, and occupies valuable ground at mines, can be turned to profit at no great expense.

Expansion of Hard Caoutchouc.

Ordinary vulcanized caoutchouc should contain about 1-10th to 1-6th of sulphur, a greater proportion yielding a hard, horn-like product, which expands considerably when heated. It was established by Mr. Kohlrausch, some years ago, that this hard caoutchouc, while expanding equally with mercury up to the freezing point, expands much more at higher temperatures, so that in a thermometer consisting of a vessel of this material filled with mercury, the latter would appear to contract with an increase of temperature. Results of experiments made by Mr. R. Fuess, of Berlin, appear to confirm Professor Kohlrausch's statement. Mr. Fuess placed a rod of caoutchouc 1-5th inch thick in a glass tube 3-5th inch diameter, and filled the tube with mercury to a height of 3 feet, exactly up to a little pin of platinum projecting horizontally from the caoutchouc. The calculations from fifteen observations in which he was assisted by Dr. M. Tiessen, gave an expansion coefficient of .000032 for each degree C. up to a temperature of 65° F.; higher figures resulting from observations at higher temperatures.

The following story has been started on the round. We will help it along: A few days ago, while the fly-wheel of the Winchester Arms Manufactory, in New Haven, Conn., was revolving so rapidly that the spokes were indistinguishable, the engineer noticed a white blotch revolving with it, but supposing that it was merely sunlight falling on the wheel, he at first made no investigation. Two hours and a half later he observed that the white streak was still there, and having stopped the engine, he discovered, to his amazement, that the apparition was a substantial white cat, which had been clinging to one of the spokes since the wheel started. She was very much exhausted, and the numberless revolutions had made her cross-eyed; but she has since recovered her strength and visual perception, and became the pet of the establishment.

AUBURN FILE WORKS, Superior Hand-Cut FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Paris, 1875.



McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS,

Philadelphia, Pa., U. S.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.
Superiority acknowledged wherever used, sold or exhibited.

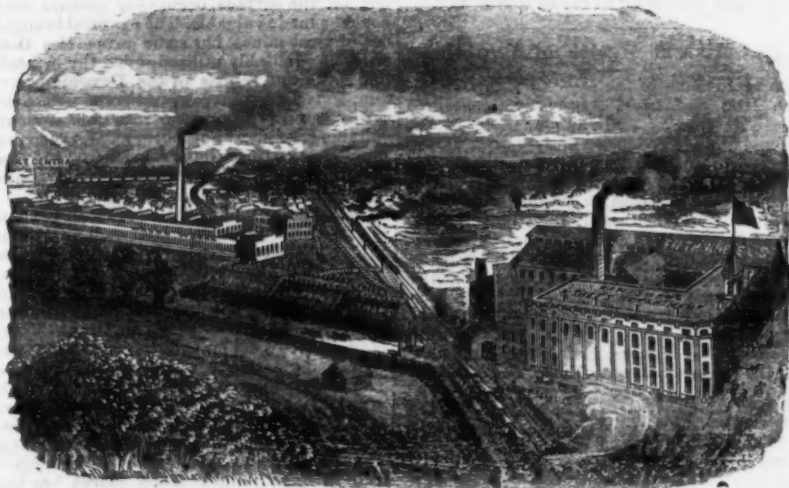
GRAHAM & HAINES,

P. O. Box 1049. 113 Chambers and 95 Reade Streets, New York.

HARDWARE MANUFACTURERS' AGENTS, as follows:

<p>Detroit Block Works, Tackle Blocks, Howard Bros. & Co., Cotton, Wool and Curry Cards Thompson, Derby & Co., Scythe Snaths, Utaseg Fork Mills, Steel Forks, Bakes, Hoes, &c. H. Knickerbocker, Scythes, Axes and Tools. H. W. Kipp, Nail Hammer. Iron City Tool Works Ltd., Picks, Mattocks, Grub Hoes, &c. Jacobus & Nimick Mfg. Co., Locks, &c. Handaway Tool Co., Planes and Plane Irons. Geo. M. Eddy & Co., Measuring Tapes.</p>	<p>Wheeling Hinge Co., Hinges and Wrought Butts. Northwestern Horse Nail Co., Horse Nails. A. G. Coss & Co., Cox's Genuine Screw Wrenches. F. K. Sibly, Emery Cloth. Sedgwick Mfg. Co., Butter and Flour Triers, etc. Ripley Mfg. Co., Mouse Traps. Sam'l Loring, Plymouth Tack & Rivet Works. Carr, Crawley & Devlin, Miscellaneous Hardware & Cast Butts. J. Mallinson, Cast Steel Shears and Scissors. Ketchum's Pat. Metallic Sieves.</p>	<p>W. D. Turner & Co., Geneva Hand Filers. American Screw Co., Gunlet Pointed Screws, &c. Romer & Co., Brass Locks, &c. P. Lowenthal, Compasses, Callipers, Dividers, &c. Clark Bros. & Co., Carriage Bolts, &c. Lowerr & Tucker, the Gen- uine Knox Fitting Machine. Kentucky Bell Co., "Dodge's" Kentucky Cow Bells. Lane Bros., Swift's and Gro- cers' Coffee Mills and Measuring Faucets, &c. T. C. Richards Hardware Co. Bright Wire Goods, Picture Nails, &c.</p>
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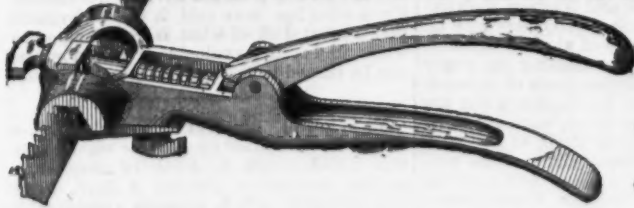
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Our new illustrated Catalogue of 140 pages, and over 300 illustrations, will be mailed on application.

THE E. D. CLAPP MFG. CO., Auburn, N. Y.

Morrill's Perfect Saw Sets.



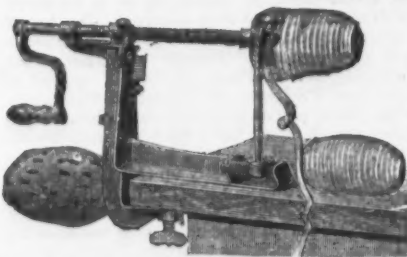
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ASA FARR,

64 College Place,
corner of
Chambers Street,
New York.

GOODSELL'S WHITE MOUNTAIN POTATO PARER

Patented June 14, 1881.



The White Mountain Potato Parer is the only machine ever made that will not only pare a potato much better than it can be done by hand taking off a thinner paring from every shape or kind of potato, but will go into and clean out the eyes, and altogether at a saving of at least 20 per cent. It is free from the objections made to the old style of rattletrap, geared parers; is solid and substantial, cannot get out of order, and so cheap as to be within the means of everybody.

Almost any of the Potato Parers in the market seem as if they might do the work better "next time," but the "White Mountain" DOES IT NOW. Every Machine warranted as represented.

Price to the Trade, \$7.50 per dozen.

GOODSELL CO., Antrim, N. H., Sole Manuf'rs.

GEO. M. SCOTT,
Bellows Manufacturer,

Johnson Street,
Cor. 23d St.,
CHICAGO, ILL.



TUFTING BUTTON

PATENTED June 28, 1881.

THE AMERICAN TACK CO., Fairhaven, Mass.,

Are making TUFTING BUTTONS with every Eye Soldered to its Back, giving them great Strength and Durability. All Buttons are guaranteed satisfactory. Also Lining and Saddle Nails, and every variety of

TACKS and NAILS.

New York Salesroom, 116 Chambers Street.

Nicholson FILES.

Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single cut,
Handsaw Taper, double cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
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RASPS.

Baker's,
Beveled Edge,
Bread,
Cabinet,
File, Flat and Half Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
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SPECIALTIES.

Butchers' Steels, Improved,
Bent Rifflers, Handled,
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Stub Files & Holder, Detach-
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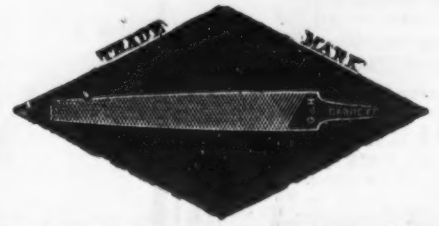
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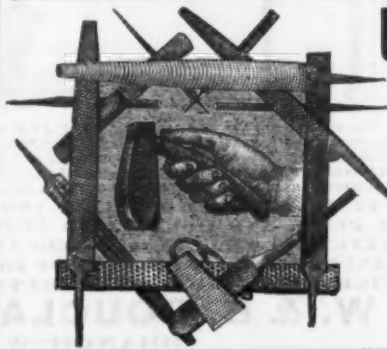
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G. & H. BARNETT,

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CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 187 Tenth Street, Williamsburgh, New York.
All descriptions of Files made to order. Price List mailed on application. Established 1843.



UNION FILE WORKS,

311 to 315 North St.,
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Manufacturers of

FILES AND RASPS

Made from the Best Refined Cast Steel.
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

MORITZ & KEIDEL, Agents,
48 & 50 German St., Baltimore, Md.

ESTABLISHED 1843.

INCORPORATED 1881.

CHAS. F. CRIPPS, President.

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THE J. BARTON SMITH CO.,

Manufacturers of the Celebrated

J. B. SMITH'S FILES, RASPS, WOOD SAWS, &c.,
211, 215 & 217 New Street, PHILADELPHIA.

New York Branch, 128 Chambers Street.
Prices the lowest. Goods the best.

WM. H. BRAMHALL, Manager.
Send for sample order.

DODGE & BLAKE.

DODGE'S PATENT

FILE FORGING AND FILE GRINDING.

These machines have long been in use in this country and in Europe, and are unequalled for perfection of work and labor saving. We now offer them with the latest improvements, and will apply them to forging and grinding other articles of tapering or otherwise irregular form.

Works at Woodside, NEWARK, N. J.

THRIFT FILE WORKS,
Manufacturers of all kinds of
Files, Rasps.



Unexcelled in quality. Full weight and size.

FILES
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

FILES! FILES!

FILES
NORTHWESTERN FILE WORKS,
65, 67 and 69 So. Canal St., Chicago,
Make a specialty of 12 and 14-inch Flat. Will be pleased to hear from parties using the above sizes largely.

STOVE REPAIRS.

Repairs for Stoves made at Troy, Albany, Rochester, Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago, Milwaukee and elsewhere, at
W. C. METZNER,
127 W. Randolph St., Chicago, Ill.

LANE'S MEASURING FAUCET.

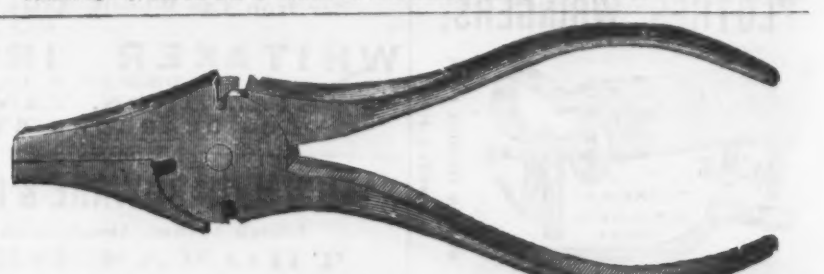
Price, \$3.00.

For Light or Heavy Molasses, Oils,
Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw files. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY
LANE BROS., Millbrook, N. Y.

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J. M. KING & CO.
WATERFORD, N. Y.

Manufacturers of the **BUTTONS PATENT**

"WIRE CUTTER AND PLIER COMBINED."

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps,
Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Price List on application. Established by DANIEL B. KING, 1859.

A. FIELD & SONS,

TAUNTON, MASS.,

MANUFACTURERS OF

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WIRE NAILS,

TACKS, SHOE NAILS,

And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

DUC'S PREMIUM ELEVATOR BUCKET.



ALWAYS FIRST
COMPETITIVE



PREMIUM IN
TESTS.

This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 50 per cent. less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 300,000 are now in use by the principal Millers, Brewers, Malsters and Manufacturers at home and abroad. It is the best Bucket made.

CAUTION.—The popularity of the DUC BUCKET has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

T. F. ROWLAND, Sole Manufacturer, Continental Works, BROOKLYN, N. Y.

The Mill Bucket, in sizes from 3 1/2 to 16 inches.

OLD COLONY RIVET CO., Kingston, Mass.

(Established 1866.)

Manufacturers of NORWAY IRON RIVETS of Superior quality.

We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belt, Barrel, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President.

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We carry the most complete stock in the city with our New York agents, *The American Tack Co.*, 116 Chambers St.

THE ANSONIA CORRUGATED STOVE PLATFORM.

With Patented O. G. Border.
ROUND ZINC.

27, 30, 32, 34, 36 inch.



Out Showing Round Platform.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discount.

Packed 12 in each case.

PURE ELECTRIC WIRE,

Manufactured by the

ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Spitzdorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Patches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

ESSEX HORSE NAILS.

Hot Forged, from Norway Iron, Warranted Best Quality, Pointed and Polished.

HOWE & CO., Troy, N. Y., Sole Agents.

The World's Wheat Crop.

The prospects of the next harvest are likely to be canvassed with more than usual interest, for although the total European wheat crop of last year was perhaps about an average one, yet so large was the deficit in the American exportable surplus, that the next cereal year must inevitably open with light, perhaps exceptionally light, stocks carried over. There are, therefore, special reasons for hoping that the wheat crop of 1882 may prove an abundant one. Up to this time the conditions affecting the growing crop of winter wheat have been very favorable, both in this country and in Europe, and the weather has also been very propitious for seeding the spring crop; but this early gain is so subject to being neutralized by subsequent conditions that nothing can be safely inferred from it. It is of importance, however, to a correct interpretation of the maturer prospects to appear at a later stage, that certain facts affecting the world's crop and consumption at large should be better understood than they now appear to be.

In making estimates of supply and demand for these times, there is great danger of attaching too much importance to the data of bygone years. Within recent times the grain trade has undergone great changes, and transition seems to be still in progress. There has been a steady and large increase, both in production and consumption, of the cereals adapted for human food, not merely in this, but also in foreign countries. In most European countries there has been, within the last quarter of a century, a large augmentation of the area under cultivation, and, at the same time, an important increase of the yield per acre. Even Great Britain, during the last decade, reclaimed 1,687,000 acres of waste land; without, however, increasing her cereal crops, for an equal extent of land has been diverted from arable to pastoral purposes. France has enlarged her acreage under wheat by 16 per cent. since 1865, and she is gradually increasing the rate of yield through the adoption of improved methods of culture. There is, however, still great room for progress in French agriculture, the present yield of wheat being only about 16 bushels per acre. If France could be induced to cultivate her land up to the English standard of yield, she would have not only sufficient wheat to supply her home wants, but also 225,000,000 bushels for export. This enormous capacity for increase in one country now dependent on us for supply is a fact that we cannot afford to overlook. Prussia also has made a vast addition to her cereal products, her crops being, in 1841, 102,000,000 bushels, and in 1879 465,000,000 bushels, or an advance from 6 1/2 bushels per head of population to 18 bushels per head. In Russia the emancipation of the serfs has produced a wonderful addition to the world's supply of grain, the exports of the empire having risen from 970,000 tons in 1866 to 6,150,000 tons in 1878. In Austria-Hungary improved methods of farming have raised the average yield of grain from 12 bushels per acre in 1840 to 15 bushels in 1876. Beyond the increase of production in Europe indicated by these facts, we have to reckon also the vast new supplies coming from Australasia, India, Africa and North and South America.

The foregoing facts indicate the enormous increase of production that has been found necessary, within the second half of this century, to satisfy the augmented consumption that has sprung from the greater prosperity of the masses under the era of steam civilization. With an expansion so vast and so rapid in this branch of industry, it is clear that the data of past years afford imperfect criteria for the present, and statistics must therefore be used with due allowance for the increased consumptive requirements of each succeeding year. It is important not only to allow for this increasing ratio of consumption per capita, but also to keep in view those countries which are decreasing or remaining stationary in production; for such failures, to keep pace with the growth of demand, make room for a correspondingly greater product in the countries having a larger productive capacity. It is the more important that this factor be carefully weighed, because the countries whose crops are thus falling behind the ratio of consumption are by no means unimportant. For instance: England's deficiency from this cause has risen from an annual average of 58,000,000 bushels, for the 20 years ending 1870, to 111,000,000 bushels yearly for the 10 years ending 1879; while France, in spite of her large expansion of crops, has increased her net imports of grain from \$2,000,000 in 1840 to an average of \$41,000,000 for the 10 years ending with 1877; and Holland, Spain, Switzerland, Belgium and Italy barely keep pace with the increase of population, much less with that of consumption.

Under these circumstances, it is of importance to ascertain the present status of each country in respect to production and consumption; and in presenting such a comparison, rather than rely upon our own computations, we prefer to give the estimates of a statistical authority that will command general respect. In his recent valuable work on "The World's Progress," Mr. Michael G. Mulhall, F. S. S., an eminent English statistician, estimates the wheat lands of the world at 105,000,000 acres, yielding 15 bushels per acre, and he states the crop, consumption, surplus and deficit of each country as follows:

	Crop, Bushels.	Consumption, Bushels.	Surplus, Bushels.	Deficit, Bushels.
U. States.....	470,000,000	250,000,000	150,000,000	.....
France.....	230,000,000	260,000,000	.....	30,000,000
Russia.....	160,000,000	80,000,000	80,000,000	.....
Germany.....	150,000,000	170,000,000	.....	20,000,000
Italy.....	140,000,000	145,000,000	.....	5,000,000
Turkey.....	90,000,000	80,000,000	10,000,000	.....
U. Kingdom.....	90,000,000	300,000,000	.....	110,000,000
Austria.....	90,000,000	70,000,000	20,000,000	.....
Spain and Portugal.....	85,000,000	85,000,000	.....	.....
Canada.....	40,000,000	30,000,000	10,000,000	.....
Australia.....	30,000,000	15,000,000	15,000,000	.....
Chili.....	15,000,000	10,000,000	5,000,000	.....
Other countries.....	20,000,000	130,000,000	.....	110,000,000
Total.....	1,540,000,000	1,540,000,000	254,000,000	254,000,000

These figures represent the distribution of supply and consumption at the nearest obtainable dates to 1879, and may be regarded as affording a fair approximation to the facts of the case. It may be necessary, however,

to make some allowance for the circumstance that, at the period here chosen for comparison, the crops of Europe were exceptionally light, while that of the United States was exceptionally large; it may therefore be open to question whether the distribution here exhibited is an entirely normal one. The exceptional conditions alluded to gave to this country an ascendancy in the trade never before reached; and it is a problem which the future alone must determine how far that relative position can be maintained. —N. Y. Commercial Bulletin.

Danger Signals on the Atlantic Coast.

Of late years the invention of the automatic signal buoy known to mariners as the "whistling buoy," has in a great measure diminished the danger of approaching our coast in thick weather. This ingenious and withal simple invention has, when in the water, nearly the same outward appearance as the ordinary iron run buoy, though larger. It is composed of boiler iron, is in shape generally like a truncated cone, and carries on top an air-whistle similar to the ordinary steam-whistle of a locomotive or marine engine. The whistle is connected, by means of a small tube, with a hollow cylinder, also of iron, extending from twenty to thirty feet below the ordinary water level, or, in other words, so far below the surface as to reach a depth undisturbed by the largest waves. Two tubes, open at top and provided with ball valves at bottom, supply air to the buoy, the air rushing in as the buoy rises and being expelled through the whistle as it falls in the trough of the sea. The iron buoys (exclusive of the bell buoy and the whistler) are of two classes, can and nun buoys. Both are made of boiler iron, and are larger or smaller, according to the importance of the danger they are intended to mark or the amount of wave buffeting they may have to endure. The can buoy is a cylinder with flat top and rounded bottom; the nun is a truncated cone (that is, the point or apex of the cone is cut off and a flat top substituted), and its bottom is rounded like that of the can. An eyebolt securely keyed into the bottom of the buoy connects it with the chain cable and anchor used for mooring it in position. The anchor is usually what is called a "mushroom," that is, a solid hemisphere of iron, slightly concave on its under side, so as to give by suction greater resistance—much as we see boys lift bricks and stones by means of a disk of wetted leather. These mushrooms, when once half buried in sand, can scarcely be lifted from their beds, requiring to be pulled sideways before they can be detached from the bottom. Where these are not used heavy stones are shackled to the cable. Ordinary ship anchors cannot be used, as those of sufficient size would be too cumbersome to transport in numbers, and all would, by the projection of the fluke and stock, be likely to become fouled by the chain and tripped by the buoy in the first heavy sea. Stones and mushrooms, on the contrary, admitting of swivels being secured to their eyebolts, cannot be fouled by the chain in any weather.

German Tariff Revision.—A majority has been secured in the Bundesrath for the tobacco monopoly. A bill which will take precedence of the customs tariff has been submitted in the Bundesrath raising the duties of some descriptions of iron, hardware, rope, honey and store goods 3 to 20 per cent., but owing to depression among the millers in Germany the import duty on foreign corn is reduced to an extent corresponding with the export duty.

The engineer in charge of the work of rebuilding the St. Charles Bridge has fifty-six carloads of material on the ground, and predicts that when the permanent new spans are finished, about two months hence, the bridge will be the best of its kind in the world. In general design these new spans will resemble the new west span, put up about two years ago by the Baltimore Bridge Company. In fact, the plans of the spans about to be put up only differ in the matter of floor beams, which are deeper and more massive than in the western span. All the parts are made of wrought iron, riveted together, and have been manufactured by the Keystone Bridge Company, from plans furnished by C. Shaler Smith. The two new spans will cost \$160,000 when put up. No alteration is to be made in the line of the approaches; they will maintain the peculiar curves, as at present. The approaches, which consist of an iron trestle, are now constructed with wrought-iron posts 32 feet apart, with a truss to maintain the weight between each pair of posts. All these trusses now in the approaches are to be taken out, and replaced by posts, reaching to the ground, of the same dimensions as those in present use.

The American Consul, at Iquique, Peru, complains of the lack of direct communication with that port, either by rail or steam, but he says the consumption of American goods, imported by way of Valparaiso, is considerable, and is on the increase. Among others may be mentioned iron bedsteads, cooking stoves, plated ware, cotton goods, sewing machines, cutlery and hardware of various kinds. The market is a good one, and with the increased exportation of nitrate to the States, there ought to be an increased exportation of American goods.

The papers in a suit for \$450,000 damages have been served by the United States Marshal on the City of Boston at the instance of Marcus P. Norton, trustee, and Christopher C. Campbell, both of Massachusetts, and Benjamin Richardson, of the State of New York. The cause of the action is the alleged infringement of an invention for steam fire-engine pumps owned by the complainants and patented by James Knibbs on April 27, 1864.

The official return of the United States Consul, at Sheffield, of the exports to the United States during the quarter ending March 31, shows an increase in the total value of \$53,344 as compared with the corresponding quarter in 1881. The improvement is chiefly in steel and steel rails.

ESTERBROOK'S

STANDARD and RELIABLE

STEEL PENS

FOR SALE BY ALL STATIONERS.

ESTERBROOK STEEL PEN CO.

Works, Camden, N. J. 96 John St., New York

Cutlery.

THE
LAMSON & GOODNOW MFG. CO.,

Salesroom and Warehouse, 38 Chambers Street, New York City. Factories, Shelburne Falls, Mass.

Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest price in wood and iron handles.

OUR
BUTCHERS' and HUNTERS' KNIVES

Are warranted to be equal in style, finish and quality, to any goods made in the world.

"COMPARE, THEN JUDGE."

We are the sole owners of the *Gardner Patent Guard and Rest for Carving Forks*, and the manufacture of fine carvers is with us a specialty.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

TRADE MARK.
FOUR PEPPERCORNS AND A DIAMOND.
GRANTED A D 1766 BY THE
CORPORATION OF CUTLERS OF SHEFFIELD
AND PROTECTED BY ACT OF PARLIAMENT.
REGISTERED ALSO AT
WASHINGTON U.S.A. ACCORDING TO ACT OF
CONGRESS.
ALSO AT LEIPZIG, IN
ACCORDANCE WITH THE GERMAN TRADE
MARKS REGISTRATION ACT.

It having come to the knowledge of
JOHN WILSON that Counterfeit Butchers
Knives, purporting to be of his manufacture,
are being sold in the United States, he here-
by cautions all purchasers of his Knives and
Steels to be on the alert against such im-
position.

JOHN WILSON also hereby gives Notice,
that it is his determination to institute Legal
Proceedings against any person or persons who
may be detected infringing his Trade Mark.

Every article of JOHN WILSON'S man-
ufacture, bears the Trade Mark, in addition to
the Name.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

AMERICAN MADE RAZORS

CUSHION BELT
OUR NEW PATENT
COMBINATION RAZOR STROP
No 230

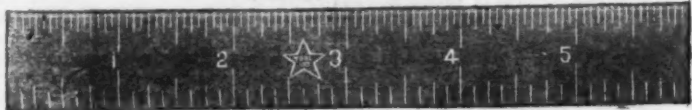
J. R. TORREY,
MANUFACTURER OF
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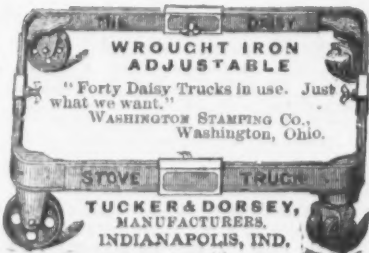
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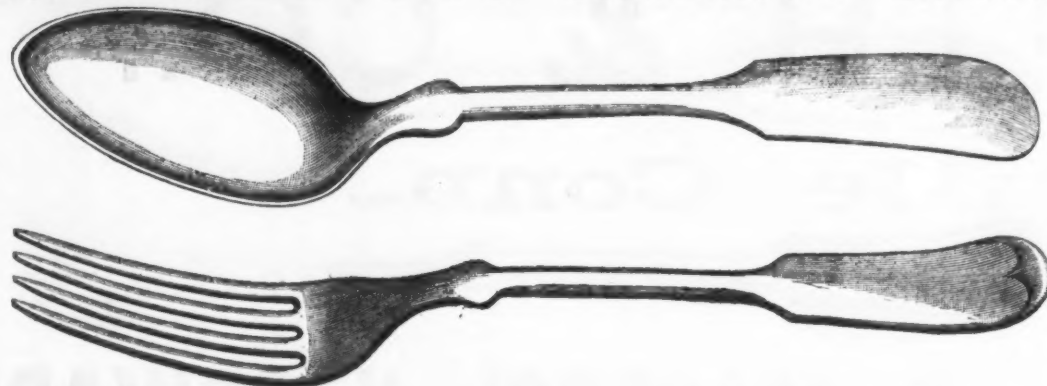
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Iron Making in South America.

BOGOTA, U. S. COLOMBIA, March 8, 1892.

To the Editor of The Iron Age.—DEAR SIR: On page 5 of The Iron Age of January 20th last, I find a very much colored de rose article on "South American Iron Works," which is calculated to mislead any person who takes an interest in the matter. As I understand that the promoters of the enterprise are seeking capital in the United States to complete the works, it would be well to refer to the following extracts of a report made by Col. Thomas B. Nichols, formerly with Carnegie Brothers & Co., who was sent to examine and report upon the works for the Colombian Government. The works are being built by the Government of the State of Boyaca, and are located three days on muleback from this city. Colonel Nichols says in his report:

In the plan and construction of the works at Samaca, it appears that the fact has been entirely overlooked that the object of an enterprise of this kind is to make iron. A large sum of money has been employed in the erection of costly buildings of brick and cut stone, adorned with crosses and shields containing, in letters of gold, the names of the officials who have promoted the enterprise. The roofs, which are of iron, have been brought from the United States at great expense, while there are in the vicinity tile roofs that have served for 200 years. On account of the very damp climate, I doubt if the iron roofs will be of any service after three or four years. * * * The working-men were employed in painting the brick buildings. * * * A careful examination revealed the fact that many of the buildings are badly cracked, principally that intended for the blowing engine. This is due to the bad foundations. The stock-house, which is built of cut stone and brick, cost some \$5000. One equally as useful could have been built for \$500.

The building intended for the rolling mill is entirely too small and not suitable for the purpose required.

The blast furnace is a costly affair of cut stone, calculated to produce about 10 tons of iron per day. Owing to the bad foundations the work is already settling, being cracked in two places from top to bottom. An examination of the hearth and lining led me to believe that the material employed was not refractory. For trial, I selected two pieces of the stone hearth and some bricks from the lining and placed them in a small cupola with a quantity of coke. I found it extremely difficult to keep up steam and was compelled to suspend the blast at the end of forty minutes. Opening the cupola I found the stone and brick melted into a confused mass. The representative of the Government not being satisfied with the test, I requested him to select samples for me. This being done, I repeated the trial, the results of which accompany this report, showing that the blast furnace in less than 24 hours could be melted almost like glass. Instead of arranging the hot-blast stoves so that they might be heated by the furnace gases, they are arranged to be heated by coal, in fact it appears that everything has been built to use the greatest possible quantity of coal.

The draft chimney is but 65 feet high, and is entirely too low for this altitude (9000 feet above sea level) and is too small in cross section.

The method of extracting coal is absurd and expensive. Thirty-two men dig 24 tons per week. At this rate 240 men will be required to dig coal for the blast furnace alone. There is no system in the work. On one of my visits to the mines I found some of the men asleep.

It is not possible to say with certainty that there is abundance of iron ore. A careful examination showed that no extensive explorations have ever been made, the samples for analysis having been selected from the surface of the ground. A few hundred dollars might have been used to find out what is necessary before spending \$400,000, as has been done.

The following is an analysis made in Philadelphia, United States, of the ore on which the greatest faith is placed:

Pure iron	28.04
Oxygen	12.00
Water	15.00
Silica	27.02
Phosphoric acid	3.82
Alumina	6.00
Lime	.002
Magnesia	.003
Oxide of manganese	.004
Undetermined	.193

The quantity of silica and phosphorus is notable.

The accounts at Samaca have been kept in a very curious way. No one could tell what anything had cost. Some of the leaves have been cut out of the ledger. The representative could not tell me the cost of a thousand bricks; a ton of any of the materials, what any particular building or all the buildings cost, in fact none of the details necessary for the economical management of such an enterprise. However, by referring to old reports, I find accounts showing that over \$400,000 has been spent in the work, that, in my judgment, could be done for \$125,000.

The enterprise from the first was projected on altogether too grand a scale for the necessities of the country. In one week all the cast iron that the country would use in a year could be made in a blast furnace of the size contemplated.

Tensile Strength.—Some interesting testimony was lately adduced in the Lowry-Hartup arbitration. Mr. J. L. Gill was examined at some length in regard to the strength of the iron contained in car wheels and the degree of tensile strength required in large castings, such as had been used in the construction of the pumping engines at the Hiland avenue water works. Iron which would withstand a tensile strain of 28,000 pounds, Mr. Gill regarded as too dense for the purpose required, and more brittle and liable to fracture than iron of a tensile strength of 18,000 to 20,000. In reply to a question as to what quality of iron would be shown by 180 samples which average in tensile strength from 15,000 to 20,000 pounds to the square inch, Mr. Gill said that he would regard it as first-class in every respect. Mr. Wm. Sterritt, a founder of 32 years' experience, found fault with Mr. Lowry's method

of obtaining samples for testing by boring into castings. In his opinion the iron to be tested should be cast upon the portion of the machinery whose strength it was desired to ascertain. From the quality of the metal used in the engines, he was not inclined to think that it would withstand a tensile strain of 25,000 pounds to the square inch.

Lubricating Soaps for Wire Drawing and Similar Purposes.

BY W. J. MENZIES.

Soap for making "suds" for brass and copper and steel wire drawing, screw-cutting and other lubricating purposes, is now largely used by many establishments. Some study of this subject, therefore, from a chemical as well as a practical point of view, will be of interest to many engineers and manufacturers. All kinds of hard and soft soaps are variously used in different works and machine shops for the purposes just mentioned, mixed with water in varying proportions with different kinds of oil. The most suitable soap, however, to use is undoubtedly a pure potash soap, as nearly neutral as possible; that is to say, containing no free or unsaponified potash.

There are several reasons why a potash soap is far superior to a hard or soda soap for these purposes. In the first place, a pure potash soap is naturally much more soluble than a soda soap, besides being softer and more emollient or of a more lubricating nature. One pound of pure potash soap dissolved in four times its weight of water forms a thin oily liquid, flowing perfectly when quite cold, and of itself, for many purposes, a first-class lubricant without further addition of oil. One pound of pure, hard soda soap, containing just as much water to begin with as the corresponding pure potash soap, requires twenty times its weight of water to make a liquid soap when cold, and even with this amount of water the liquid is inclined to be clotty and somewhat of the nature of starch. If any less quantity of water is taken the solution will, when cold, set into a jelly soap. It will be evident to most practical mechanics that any liquid containing 95 per cent., or twenty times its weight, of water, cannot be of a very suitable nature for lubricating purposes, quite irrespective of other considerations.

For making "suds" for wire drawing or other similar purposes, the soap is used chiefly to keep the oil in suspension in a certain amount of water, added to prevent the oil heating when subjected to the extreme pressure of the wire-drawing operation. Less potash soap is required for this purpose than a soda soap, as, owing to its greater solubility, a given weight of potash soap will keep a much larger quantity of oil in suspension than the same weight of soda soap.

It is very difficult to obtain a potash soap suitable for these lubricating purposes. The soft soap or potash soap of commerce is generally more or less adulterated, and never neutral—that is to say, always containing an excess of free or unsaponified potash. This is very objectionable, especially in the case of brass and copper wire. Zinc is readily attached and rendered soluble in a solution of caustic potash or caustic soda, and copper also is attacked, though to a much less extent. The action of the free alkali, therefore, has a tendency to dissolve the wire in the act of drawing, and this is materially assisted by the enormous pressure which it then undergoes, and interfering, to a certain extent, with the facility with which the wire can be drawn by forming a cloggy mixture. It may be suggested that the mixing of soap with an excess of oil, so as to form the suds, removes, by saponification, this excess of caustic alkali, but it is by no means the case unless the oil is previously boiled with the soap without any large excess of water.

There are many adulterants added by manufacturers of soft soap, in order to cheapen the article and increase the profit, and they are of a very similar nature to those substances with which hard soap is now adulterated to such an enormous extent. Silicates of soda and potash—that is to say, compounds of sand and soda dissolved in water, forming thick, gummy liquids—are most objectionable adulterants when the soap is required for lubricating purposes. Yet these substances are now used to an enormous extent by manufacturers of both hard and soft soap. Many soaps contain thickening compounds to make them take up and hold more water, such as starch and potato-flour—doubtless useful articles for this purpose from a soapmaker's point of view, but not suitable for lubricating purposes. A certain amount of caustic soda is often used in the manufacture of soft soap, the result being really a mixture of potash soap and soda soap, instead of a pure potash soap. The reason why this is done is that soda is far cheaper than potash, and also by its use more water can be got into the soft soap. As previously explained, however, this is very objectionable, as a potash soap is far superior to a soda soap for lubricating purposes.

If a really first-class neutral soft soap cannot be obtained, wire-drawers and others requiring a pure potash soap for making their suds and other purposes, will generally find it both cheaper and better to make their own soft soap. This would have been quite impossible a short time ago, as the production of potash soft soap was a tedious operation, requiring long boiling, special apparatus, and much time and practical knowledge. With the introduction of caustic potash, however, and the use of the "cold process," a pure potash soap can be simply made by a mixing process without any trouble whatever. The following directions are all that is necessary for its manufacture:

Take twenty pounds of pure caustic potash; put it in any iron or earthenware vessel with its own weight that is to say, two gallons of water. It will dissolve almost immediately by heating the water. Slightly heat nine and a half gallons of oil until warm to the hand, say 140° F. This is most easily done by bringing a small portion of oil up to the boiling point and adding it to the rest of the oil used. Now pour the caustic potash lye into the oil in a small stream, with continuous stirring with a flat wooden stirrer two or three inches broad

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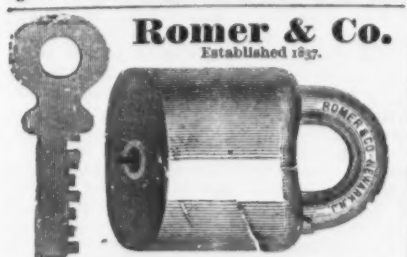
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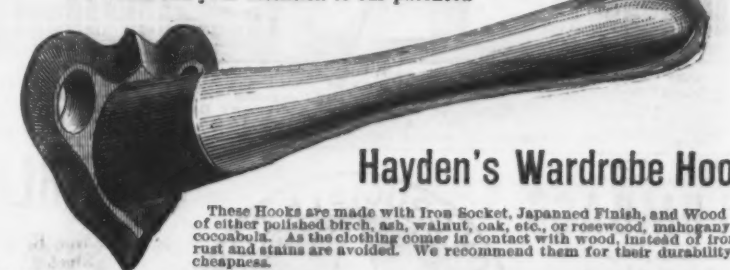
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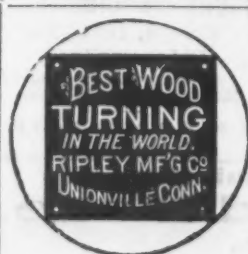


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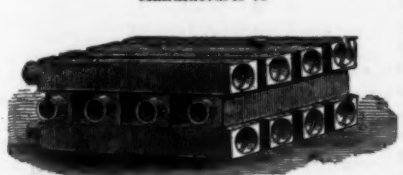
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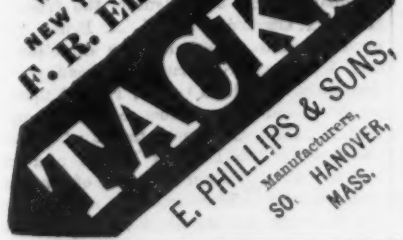
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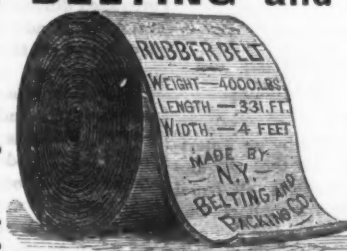
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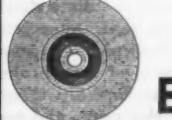


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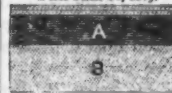
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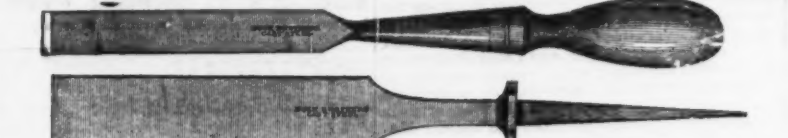
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Continue to stir until the oil and lye appear well combined and smooth in appearance. A few minutes will be all that is necessary. Put away the mixture in a warm place, covering well up with blankets or woolen rugs to keep in the heat, caused by the mixture slowly combining and turning into soap. This wrapping up is very important, as the object is to keep the temperature uniform until the saponification is completed. The mixing may be done in a wooden vessel—half an oil barrel answers the purpose well. After three or four days the soap is formed, and may then be used, though it is generally better to stir up well again and leave it standing, still well covered up in a warm room? another three or four days. This insures the perfect saponification of all the oil, if any of it has separated from the lye after mixing in the first instance, which is sometimes the case. In this manner the finest possible soap for lubricating, and also for washing and cleansing purposes, can be produced. It is a real potash soap, made pure for use and in the most highly concentrated form obtainable, and not simply made cheap for sale, with a large excess of water and impurities added. In passing it may be remarked that a soap thus made cannot be excelled for general washing purposes, especially flannels, and being neutral and containing no adulterants, washing all day with it will never give sore hands. This is a hint that some working mechanics may think it worth while to carry home and adopt for their own use.

With reference to the best kinds of oil to use. For wire drawing nothing excels a really first-class pale seal oil, and it also saponifies well. A really good, refined cottonseed oil may be used for soft soap making, and it is a most excellent and cheap oil for making soft soap for general purposes, though very inferior to pale seal oil when added to the soap and water to make suds. As to the caustic potash, it is absolutely necessary that it be pure and unadulterated, as the whole principle of the cold process of making soap entirely depends on the use of a strong, pure lye of caustic potash; in fact, complete saponification cannot be obtained without this; therefore, Montreal potash, wood ashes, or any other impure form of potash, will not do at all. Pure caustic potash is a very deliquescent article that soon melts away when exposed to the air; therefore, small packages just sufficient for one operation, are very necessary. Caustic soda has been frequently sold to the public as pure potash under the name of rosh potash, or ball potash, in one pound packages. It is needless to add, after the foregoing remarks, that these articles not being real potash at all, are entirely unfit for soft soap making.

The calculation of cost of this potash soap for lubricating purposes, depends somewhat whether the price of the oil and potash is taken at retail or wholesale figures. Even with retail prices the cost of production will not exceed about 7 cents per pound. With cottonseed oil and wholesale prices it can be produced at about 5 cents per pound, which, considering that this soap contains only half the quantity of water an ordinary soft soap usually contains, would be equivalent to buying an ordinary soft soap at about 2 1/2 cents per pound.

About six pounds of pure potash soap combined with eight gallons of water and three gallons of oil, make a good "suds" for wire drawing. The best way of making the suds is as follows: Put the six pounds of potash soap into a bucket with two gallons of hot steam water. Heat it up so as to thoroughly dissolve the soap, with a bank of wire used as a whisk. Then add the other six gallons of water, and lastly, three gallons of best pale seal oil, which should be thoroughly stirred into the soap and water so that on standing all night the oil will not separate out. This mixture will be found to give very good results.

Forging a Large Shaft.—The engines for the Old Colony steamship, to be called the Pilgrim and which will be about 70 feet longer than the Providence and Bristol, are now being built at the Morgan Iron Works in this city. The two shafts for these engines are the largest ever forged. One of them is ready to be turned and finished, and the other is now in the forge. The material used is made up of scraps of boiler plates, nuts and screws and horseshoes, and is first run into bars two feet or more in length. The shaft is built by welding together from four to six of these bars, properly shaping them under the blows of a powerful steam hammer. An additional number of bars is then welded on to the end, this operation being continued until the shaft is of the required length. The two shafts now making are 40 feet long each, with a diameter varying from 27 to 30 inches. They weigh over 81,000 pounds. The shaft of the steamship City of Rome is perhaps as large an example of a shaft forging as now exists. It is of steel, and but 22 feet long and 26 inches in diameter, with a 10-inch hole through the center. The shaft for the Pilgrim already done was forged in thirteen days and seven hours.

A New Coke Oven.—Mr. W. G. Merriam, of Pittsburgh, has taken out a patent for an improved coke oven upon an entirely new principle. The old forms of beehive ovens have been used for a long time, without any practical improvements, and although they are very wasteful, both of material and labor, the industry has grown. With the improvement of Mr. Merriam the coke industry will commence a new expansion, to which its present magnitude is only a start. The distinctive character of Mr. Merriam's oven is that instead of the old beehive form, it is built with a longitudinal chamber, with vertical side-walls and arched top, thus holding a charge about 50 per cent. larger than that now put in an oven. The oven is charged and drawn through a door at the side, which can be closed so as to prevent the entrance of the air, and thus increase the yield of coke. Upon the floor is laid an iron framework, with a cross-piece at the rear of the oven, upon which the charge rests, and when the coking process is completed the entire mass is drawn at once by the application of steam power to the framework. This does away with having any small coke, bringing the whole charge

out in one mass, and insures an increased yield of coke of superior quality.—Greensburg Press.

The Nova Scotia Mining Report.

The report of the Nova Scotia Department of Mines is an interesting pamphlet. The following summary shows the mineral products of Nova Scotia for 1881, as compared with the previous year:

	1880.	1881.
Gold, ounces.....	13,234	10,756
Iron ore, tons.....	51,101	39,809
Manganese ore, tons.....	223	231
Coal raised (English weight) tons.....	1,038,710	1,124,270
Gypsum, tons.....	138,348	107,111
Building stone, tons.....	3,540	6,618
Barites, tons.....	40	40
Coke made, tons.....	13,125	27,871
Fire-clay, tons.....	75	401
Grindstones, &c.....	1,500	1,680

The total sales of coal for the year 1881 reached 1,035,014 tons, as against 954,569 in 1880, being an increase of 80,355 tons. The most noticeable points of the trade were an increase of 59,430 tons in the home sales, the returns showing 382,343 tons, against 322,913 tons in the year 1880. The coal sent to the Province of Quebec amounted to 268,628 tons, an increase of 29,537 over the shipments of the preceding year. The sales to New Brunswick footed up an increase of 25,709 tons. To Newfoundland they fell off some 7452 tons, and the sales to Prince Edward Island showed a slight decrease; 9695 tons less than in the previous year were sent to the United States, and the trade to the West Indies was increased by 9455 tons. The business with other countries remained unchanged. The total yield of gold during the year was 10,756 oz. 13 dwts. 2 grs., as against 13,234 oz. in 1880. The returns from unexplored districts amount to 2436 oz. 9 dwts. 12 grs., an increase of 1504 oz. 4 dwts. 17 grs. over the previous year. The continued decline in the produce of several districts which have hitherto yielded uniform returns, has outweighed the increased production of several districts.

Dry Docks for Large Ships.—The second of the dry docks at Erie Basin, which were unused for many years until William Cramp's Sons, the shipbuilders, leased them, has been completed, and the Inman Steamship City of Brussels is occupying it to have her bottom cleaned and painted. No other dry dock in the country would have accommodated her, and other large steamships are awaiting their turn. The two docks, each of which holds more than 6,000,000 gallons of water, are 540 and 630 feet in length, respectively, and were originally constructed with Boston capital, and, under control of Boston business men, were unsuccessful. It has taken two years to rebuild them at an expense of \$1,500,000. A board of inspectors detailed by the Secretary of the Navy have recently made a report on the capacity, facilities and construction of the docks. They were impressed with the efficiency of the iron caissons, or floating gates, made with sloping ends corresponding with the slope of the side-walls; and the absence of grooves in the abutments, permitting the opening and closing of the docks in the shortest time without difficulty. The smaller of the docks has been finished four months and has been idle only four days.

The character of German emigration becomes a subject of much interest, if we consider the large proportion which this nationality bears to the total. An analysis of the industrial qualifications of the 68,887 persons who left Hamburg last year, as furnished by United States Consul Bailey at that port, gives the following results:

	German Em- pire.		Other coun- tries.		Total.	
	No. of persons.	Per cent.	No. of persons.	Per cent.	No. of persons.	Per cent.
Agriculturists.....	9,645	66.08	4,654	33.92	13,715	100
Mechanics.....	10,105	71.50	4,297	34.50	14,132	100
Merchants.....	2,721	56.88	4,668	69.12	7,377	100
Laborers.....	10,684	55.39	5,666	34.70	16,350	100
Miscellaneous.....	1,443	62.49	996	37.51	2,440	100
Without pro- fession.....	8,651	68.47	6,173	41.53	14,854	100
Grand total.	44,787	62.11	25,100	37.89	69,887	100

How the German element predominates in mechanics and the arts is readily seen. This position they are likely to hold conspicuously.

American commerce with Africa has materially increased within the last two years, particularly with Cape Town and the neighboring colonies, and with Natal and the Island of Zanzibar on the East coast. As an indication we may point to the fact that two sailing vessels are at this moment loading at a pier on the East River, one for Cape Town and the other for Port Elizabeth, and both under the auspices of a hardware firm in Chambers street. Our exports of hardware and implements alone not infrequently amount to \$6000 or \$8000 per week. Manufactured cottons also make a considerable item. The only unfavorable feature is that our imports are disproportionately to the exports, and are becoming more so as trade develops. It is also to be observed that this trade, formerly almost monopolized in Boston, is now mainly concentrated in New York. Sea captains here say that a direct steamship line could be successfully established.

The exclusive governments of the Orient, like Siam and Corea, are yielding reluctantly, but perceptibly, to the march of modern improvements. Like China, the most stubborn opponent of progress, Siam is about to introduce the electric telegraph, a line being in contemplation between Bangkok and the Cambodian frontier. French capitalists, of whom Lesseps is said to be one, also propose to build a canal across the Isthmus of Kra, shortening the distance between Calcutta and Hong Kong 900 miles, and it is believed the Government will approve. Should Prince Prisdang visit Europe and the United States, as proposed, there will be reason to hope that the last stronghold of Asiatic exclusiveness will be constrained to yield to a more enlightened civilization.

The Northside Bridge Co., Pittsburgh, have decided to build a truss bridge at Allegheny, entirely of iron and steel.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, April 20, 1882.

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Fortieth Page.—Boston Hardware and Metal Prices.

A case of considerable importance in connection with strikes, and the employment of men to take the places of strikers, has just been decided at Pittsburgh. The case was heard before an alderman and no defense was submitted, so that it cannot be regarded yet as settled law. The Excelsior Coffin Works at that place had a strike among its men, and one of the firm went to Philadelphia and engaged several men to come to Pittsburgh to take the places of the strikers, representing, so the men engaged swore, that no strike existed, but that the firm wanted young men, because nearly all their old employees were getting up in years owned property, and did not care to work steadily. No witnesses were examined for

the defense, and the alderman gave judgment in favor of the plaintiffs. They claimed only actual damages, and the entire amount involved did not aggregate over \$120. The attorney for the defense gave notice that he would appeal the case to court. The firm claim that no strike did exist at their works, and that no misrepresentations were made. The trial and decision of this case can but be of the highest interest and importance. It will probably involve the decision of the question of what is a strike, and whether hiring men under a statement of no strike when a strike was in progress, is such a "false pretense" as will vitiate a contract. If this case is fought by both sides as vigorously as possible it will settle some interesting points, and that these points may be settled we hope it will be pushed.

The Extension of the Siemens Patent.

As was presumed in our editorial of April 6th, the attempt to secure an extension of the Siemens patent in the regenerative furnace has received the active support of at least one steel manufacturer. At the hearing on this extension before the House Committee on Patents, on Thursday, the 13th instant, a prominent steel manufacturer of Pittsburgh, who is also an officer of the American Iron and Steel Association, is reported by telegraph to have appeared and advocated the extension of the patents, very much to the surprise of the attorney who was opposing the extension, who had been counting on his assistance. It is understood that the reasons assigned by this gentleman for his advocacy of the extension were, that he had spent a large amount of money on his plant and in payment of royalties, and if the patent was thrown open it would invite competition in the steel business, and that without payment of the heavy royalties he had paid, evidently overlooking the fact that he had paid the royalties only for the life of the patent which has now expired. Now, we do not impute to this gentleman any other motives than those he has given, but it is a well-known fact that the agents of the Siemens furnace in this country have lately sent a circular, how widely we do not know, to those having rights to use the furnace, that may have had some influence. The circular is as follows:

RICHMOND & POTTS, UNITED STATES AGENTS FOR SIEMENS' REGENERATIVE GAS FURNACE, No. 119 South Fourth Street, PHILADELPHIA, April 8, 1882.

Hussey, Howe & Co., Limited, Pittsburgh, Pa.: GENTLEMEN:—There appears to be a misunderstanding as to the scope of the bill now pending before Congress for the extension of the joint patent of March 1, 1864, issued to C. William and Frederick Siemens. In each of the outright licenses granted by us, it is stipulated that the rights under the license embrace the extended term of the patents involved, and just previous to the expiration of the above-mentioned patent, upon consultation with a number of our licensees, it was determined to apply for its extension. It is not the intention to impose any further obligation by the extension of this patent upon the furnaces in use, and in case the patent, as above mentioned, should be extended by act of Congress, we are willing that our licensees shall have the right to use all furnaces which they may have constructed and used prior to the extension, without being held liable for infringing the extended patent, and it is proposed to amend the bill now before Congress to read as follows: "And provided further, that if a person, prior to the passage of this act, has made for use a furnace or furnaces embodying in its construction and operation the invention described in the patent, such person shall have the right to use the furnace or furnaces, so made, without being held liable for infringing the extended patent." Trusting the above may be satisfactory to you, we remain, Yours truly, RICHMOND & POTTS.

It will be noted that this letter virtually throws the onus of applying for the extension upon the licensees. It was upon consultation with a number of their licensees that they determined to apply for the extension. We again say we fail to see what right they have to the extension. By a law of Congress, passed after this patent was granted, all patents granted, both in this and foreign countries, expire in this country the same time that they do abroad. It was the deliberate conviction of Congress that this was just, and this patent would have expired two or three years ago had it not been that it antedated this law; but that does not affect the principle that patents here should have no longer life than the same patent has abroad. This patent has had three years more, and it is absurd and outrageous that our manufacturers who wish to use it should continue to pay royalty for seven years more, making in all ten years after it has expired in England and after manufacturers there have ceased to pay royalty.

There is another feature of this extension. On steel that is produced in this furnace, or reheated in it, we will be at just that much disadvantage in competing with the same steel made in England with this furnace, on which no royalty is paid. This would be a virtual reduction of the duty by this amount. It is also suspected that there is something back of iron and steel manufacture for which the patentees wish the furnace patent extended, perhaps to prevent its use in glass manufacture and other industries from which in this country but little revenue has been derived. However, it cannot be extended for the use of these industries without compelling all industries to pay tribute. We have very little idea that the patent will be extended. We do not believe that the committee will report favorably to its extension, and if they do it will not pass the House.

"Fair trade" has at last got a vote in the English House of Commons, and a motion to

inquire into the effects of foreign tariffs in British trade and commerce, which was avowedly a fair-trade resolution, received 89 votes. The notable feature was Sir Stafford Northcote's action in supporting the motion, while two years ago he denounced such an inquiry as injurious.

Relative Expenses of British and American Steam Navigation.

We have heard it asserted by an American steamship proprietor in the Havana trade, that with two steamers of equal capacity, running from the same wharf, one a chartered vessel under the English flag and the other home-built, the former did a much more profitable business. The reasons therefor, if exactly stated, would have a deep practical interest at the present crisis in our foreign shipping trade. They might indicate exactly what remedial measures are best calculated to restore our lost prestige. Almost a parallel case is presented in the experience of the American Steamship Company, of Philadelphia, which proves to have been a financial failure. Remarkable on the fact, a Philadelphia correspondent of the *London Times* says:

In the financial part of the report is found an item showing that in 1881 the Pennsylvania Railroad advanced \$200,000 to pay the year's interest on the guaranteed bonds of the steamship company. This paragraph in the report has naturally caused a great stir. It has long been known that the American steamers were not paying, but the above statement indicated that the railway which has been their financial support contemplated easing its advances to the company. Except at the beginning of their career, the steamships have gone behindhand, and a short time ago the sum of the advances made for interest, &c., was capitalized by the railway in an issue of it of stock of the steamship company, so that now it holds the larger part of the stock. While the quotation of the stock is nominal, no dividends being paid, the 6 per cent. bonds are at 107 to 108, the interest being guaranteed.

In this line for several years the American and the British steamers have been running side by side with exactly equal chance to demonstrate what could be done. The British steamers are better cargo ships, while the smaller American steamers devote more space to first-class cabin passengers. While the Americans do not earn their expenses, the English companies owning the others, I understand, make 10 per cent. annual profit right along. The rate of freight is equal, the facilities for getting and handling cargo are the same, but the expenses of the Englishmen are less, and in this they save enough to make their profit. I am told that it costs proportionately 20 to 30 per cent. more to sail the American than the English steamer in the same line. The management of the Pennsylvania Railroad, who have been paying the interest and making up the deficit for the American ships, have nothing of the kind to do for the Englishmen; yet the British fleet just as well accomplishes the railway's main object in going into the enterprise—the carrying of the railway through freight from the West to Liverpool. Looking at the matter purely in a business light, and with the benefit of the experience that demonstrates that the freight carrying is accomplished as readily by the British as the American steamers, and with no outlay for investment or risk of guarantee, the railway has determined to advance no more money and guarantee no more bonds, as has sometimes been proposed, for the construction of additional American steamers for the line. There will be no cessation of the line, which has a valuable traffic; but the "British end" of it will grow larger, and hear that one or two new and first-class cargo vessels are soon to be added from British shipyards. The experiment of a decade has taught that in the Transatlantic trade, owing to greater first cost and heavier sailing expenses proportionately to tonnage, American-built iron steamers cannot yet compete with the British.

Aside from the expense to "heavier sailing expenses," it does not appear from the foregoing why the foreign vessel earned 10 per cent. per annum while her American consort was losing money. We are justified in looking for the true explanation in greater tonnage dues, charges and fees, extorted from American shipping under our Federal, State and municipal laws. These latter should be made the subject of a searching inquiry. If the difficulty lies here, of course the cry for "free ships" is started too soon. Let us try free shipping first.

The action of the Western Nail Association in reaffirming the existing card was fully justified by the reports received at the meeting, showing that the demand for nails the past three months was as active as the reasonable manufacturer could desire. The make of nails for the first three months of the year was 250,000 kegs more than the first three months of 1881, while the stock on hand April 1, 1882, was 150,000 kegs less than April 1, 1881. This shows a difference in the total consumption of 400,000 kegs. The election resulted in the choice of the old officers: B. F. Jones, president; J. N. Vance, of Wheeling, and Gen. Charles L. Fitzhugh, vice-presidents; Joseph D. Weeks, secretary and treasurer.

The steamship *Alaska*, of the Guion Line, which arrived from Liverpool on the 16th inst., has again beaten the record. This trip was accomplished in 7 days 6 hours and 20 minutes actual time, and was 23 minutes faster than her last outward trip, which was 1 hour and 5 minutes quicker than the best passage of the *Arizona*, of the same line, which vessel, until the appearance of the *Alaska*, had the reputation of being the fastest steamship afloat. During the wonderful passage which the *Alaska* has just completed considerable rough weather was encountered, the wind blowing from the westward the greater portion of the time, while the seas often ran very high. On several days she made a spurt of 17½ miles an hour, and the day before reaching port she performed the unprecedented feat of running 419 miles in 24 hours.

The German Pig Iron Industry.

Notwithstanding the efforts of the German Government to promote the pig iron industry of that country, or to cause a continuation of the healthy condition of the market which prevailed during a portion of the year 1879, a slow but steady decline in prices was experienced, and at the beginning of 1880 future prospects were anything but encouraging, and considerable depression was felt in all quarters. The sudden revival of the German trade in 1879 was probably, to a great extent, due to the large demand in the United States and to the consequently large importations; but when the necessary improvements and extensions of German works had been made, and when American establishments were better prepared to satisfy American wants, the above-mentioned relapse occurred, and prices were again reduced until they ranked no higher than those reigning during the early part of 1879. Little improvement in this direction was experienced during 1880, and the year 1881 began with even less cheering prospects, so far as prices were concerned, although the demand appeared to be on the increase. During the second half of the year, however, some gratifying changes occurred, furnishing unmistakable evidence of subsequent improvements. The gradual and steady rise in the prices of pig iron which took place was, in general, considered as a very favorable indication of the revival of the market, this indication daily gaining in strength as the expectations of ironmasters were realized. The number of incoming orders assumed larger dimensions, prices rose uninterruptedly throughout the remainder of the year, and everything was in a promising and exceedingly gratifying condition. No anxiety and no fluctuations resulted from any external disturbing influences, and at the close of the year it was considered a recognized fact that the despondency which had hitherto brooded over the iron trade was a thing of the past, and that a sound basis for future prosperity and success had been established. The prices of pig iron were, as usual, subject to the same fluctuations as prevailed in England, and it is undoubtedly a matter of interest to know that any sudden and great variations in English prices were correspondingly represented in the German market. The prices in Germany, moreover, vary not only according to the quality of the material, but are influenced to a great extent by the time at which contracts are closed, and it is mainly due to this fact that the published quotations do not in all cases correctly represent the state of the market for the time being. The following table gives the prices of English pig in shillings per ton, and the prices of German pig in "marks" per ton for the beginning of each month of 1881, and also the prices prevailing at the beginning of January, 1882; the figures, though not absolutely correct, as we have disregarded the fractions of shillings and marks, offer an interesting comparison between English and German prices:

Date	Great Britain.	Wenphalia.	Upper Silesia.	Lower Silesia.
January 1881.	44	44	44	44
February	44	44	44	44
March	44	44	44	44
April	44	44	44	44
May	44	44	44	44
June	44	44	44	44
July	44	44	44	44
August	44	44	44	44
September	44	44	44	44
October	44	44	44	44
November	44	44	44	44
December	44	44	44	44
January 1882.	44	44	44	44
February	44	44	44	44
March	44	44	44	44
April	44	44	44	44
May	44	44	44	44
June	44	44	44	44
July	44	44	44	44
August	44	44	44	44
September	44	44	44	44
October	44	44	44	44
November	44	44	44	44
December	44	44	44	44
January 1882.	44	44	44	44

1) Minimum, 45-10. 2) Min., 50. 3) Min., 45½. 4) Min., 50. 5) Min., 35-10.

So far as the production of pig iron is concerned, it should be stated that the total output in 1881 did not greatly exceed that of the year before, but the comparatively very large increase in the quantity of iron ore raised, suggests an increased output of the various blast furnaces for the current year, and it is, therefore, but natural to anticipate considerable activity in the construction of new furnaces and in the blowing in of such as are at present undergoing repairs. There is little, if any, anxiety as far as over-production is concerned, since the rapid growth and extension of the different railways call for considerable quantities of material with which to conduct operations. Judging by such reports as are available at the present time, it appears that the imports of pig iron during 1881 somewhat exceeded those of 1880, Scotch and Bessemer hematite pig being in special demand. The general introduction of the basic process will probably soon allow the latter to be dispensed with entirely, while

Scotch pig will undoubtedly retain its present position until some German manufacturers are prepared to furnish foundry pig alone, and are able to produce a good quality of iron.

The German importations of Spanish, Italian, African and Dutch ores, which have lately increased to some extent, present a formidable barrier to the growth and progress of numerous small mining localities, and it has been a matter of much attention on the part of those interested to investigate whether it would be more profitable to smelt foreign ores, or whether it would be advisable to suppress their introduction and to confine ironmasters to the use of home productions. It must be admitted that the importations of ore from foreign sources are a benefit only to large works distributed among the different manufacturing centers, while small establishments which are spread throughout the country are oppressed and injured in a corresponding degree. It will have been observed from the foregoing remarks that the importations of iron ore and pig iron have been characterized by a steady increase, and it may therefore be well to say in this connection that the export has also experienced a marked improvement. We have not attempted to go into particulars as regards the trade in distinct sections of the country, but have merely reviewed, in as brief a manner as possible, the general outline of the pig iron trade during the year specified, leaving details to a future time.

William Menelaus.

For the second time within the brief space of three months, we are called upon to mourn the death of one who stood foremost in the ranks of those actively engaged in promoting and extending the iron and steel industries of their respective countries. The death of Mr. William Menelaus, the famous manager of the Dowlais Iron Works, England, has deprived the British iron trade of its leading spirit, of a man who was an object of pride and emulation to every member thereof, and the intelligence of his death was received with profound sympathy and sorrow in every iron-making district in the country. The malady was of a kind and severity which precluded all reasonable grounds of hope for a favorable issue, and the end, which seemed inevitable from the first day of sickness, approached slowly, but steadily, and on Thursday morning, March 30, he passed quietly away. Notwithstanding the continuity in genius and talent which, perhaps, forbids the loss to be considered as irreparable, the death of Mr. Menelaus creates a gap which cannot be filled in a moment. Throughout his life, and more especially in the later period thereof, when his extraordinary ability as a practical maker of iron and steel had enabled him to occupy a prominent position in this vast industry, he most resolutely refused to afford the slightest response to the numerous applications for particulars of his history, and the memoir here given must necessarily lack completeness in some respects.

Mr. William Menelaus was born in East Lothian, Scotland, on the 10th of March, 1818, and he had, therefore, but recently completed his 64th year. After spending his educational years in the locality in which he was born, he was for a short time connected with a firm of engineers at Haddington. While in London, in the year 1843, he was engaged to undertake the repairs of a mill, and the execution of the work gave such satisfaction that he was subsequently sent to the Abernethy Iron Works for the purpose of erecting some large machinery. Here, too, he gave evidence of that wonderful practical ability which so distinguished him in later years, and a short time after he was appointed engineer to the Aberdare Iron Company. In that capacity he remained until 1850, having altogether been at Abernethy a period of seven years. Upon the death of Sir John Guest, the trustees, Mr. G. T. Clark and Mr. H. A. Bruce (now Lord Aberdare), assumed the direction of this Lothian concern. The manager at that time, Mr. John Evans, retired upon a pension, and the trustees conferred upon Mr. Menelaus the appointment of general manager of the Dowlais Works and collieries. This position was one of immense responsibility and power, for it must be understood that Mr. Menelaus was not an ordinary manager, subject to certain limits for reference. The trustees believed they had found in him a fitting man for the active direction of the great concern, and they left him unfettered, with unlimited discretionary powers. How well he justified their judgment and choice is best attested by the enormous strides of the Dowlais Works under his management. Those who remember what the Dowlais Works were when Mr. Menelaus was promoted to the general management and know what they are at the day of his death, can best appreciate the prodigious energy, the marvelous skill, and the incessant activity of head and hand by which these grand results were brought about.

The management of Mr. Menelaus was characterized by a spirit of unbounded enterprise. He was one of the earliest men to give a practical hand of sympathy to Mr. Bessemer, and the Dowlais Works were associated in the most honorable manner with the development and final success of the brilliant, but simple invention, which has so completely revolutionized the iron trade. Mr. Menelaus correctly gauged the probable effect of the new discovery upon the old iron

dustry, and with commendable forethought laid down a Bessemer plant, which enabled the Dowlais Company to enter into the manufacture of steel at the earliest moment, and it is the boast of the Dowlais Works that there was rolled the first steel rail ever sent forth into the open markets of the world.

Prior to this, however, were the attempts to solve the question of mechanical puddling, in which problem the efforts of Mr. Menelaus were almost rewarded by success. It was long before Mr. Danks, whose name has since been so prominently identified with mechanical puddling, ever attempted to put his notions into practice that Mr. Menelaus had experimented with a rotary furnace at the Ifor Works, at Dowlais. The respective systems of these two gentlemen were, singular to state, exactly identical in principle up to a certain point. Under Mr. Menelaus's system pig iron was converted into large and tolerably homogeneous masses of puddled iron, but the difficulty lay with the interior lining, technically known as the fettling, which became dislodged and broke up as the contents of the furnace assumed a condition of malleability. The detached fragments wandered to and fro in a most unsatisfactory manner, and often formed around the glowing mass incrustations of a character which greatly interfered with its normal purity. This defect Mr. Danks professed to have overcome, but, for some reason not understood, his scheme was never adopted at Dowlais. If Mr. Menelaus failed as an original inventor, as an adapter he was singularly successful. The application of blast to furnace, engine and smithy fires, the introduction of the coal-washing machine, new forms of steam hammers, rolling, blooming and other processes connected with the manufacture of the finished rail of iron or steel, were all and several innovations which kept the gigantic concern with which he was connected well abreast of the times.

As a general business manager and as a ruler of men, Mr. Menelaus's abilities were conspicuous, few being equal to him in this respect, and none surpassing him. He was the founder of the South Wales Institute of Mining Engineers, of which he was the first president, an office which he filled a second time, and which would have been conferred upon him for the third time in October last had the state of his health permitted him to have accepted the honor. He was also one of the founders of the Iron and Steel Institute of Great Britain, of which he was elected president three or four years after it was inaugurated, the president of the first year, when the Institute visited Merthyr, being the Duke of Devonshire. In 1879 Mr. Menelaus was presented with the Bessemer Medal of the Institute, in recognition of the great service he had rendered in developing the Bessemer process of steel-making. The volunteer movement was another matter in which Mr. Menelaus took a very active interest. He was one of the originators of the movement, and one of the first officers of the Dowlais detachment, with which he was connected for a period of something like ten years. He was connected with the Dowlais Iron Works for a period extending over thirty-two years, and the growth of this gigantic establishment while under his care is shown by the fact that the weekly output of iron has been nearly quadrupled, in addition to which extensive tin-plate works have been started, turning out large quantities of plates in lieu of iron rails, and there is no reason for doubt that if Mr. Menelaus's health and strength had remained unimpaired he would have made still further extensions and improvements. It could scarcely be said of Mr. Menelaus that he was of a literary turn of mind or a great speaker; but he was a considerable reader, and no man could express himself with better effect in conversation and state his meaning more clearly. He had a vast store of general knowledge, and could enter into and sustain a discussion upon an inconceivable variety of subjects outside his own specialties. He almost always acted upon the rule of having daily reports from all the various departments under him, each of which he minutely examined himself, so that he possessed a full and perfect knowledge of the position of every portion of the works, and the variations of every twenty-four hours. Another feature of his success was undoubtedly his untiring perseverance, his great regularity and his close application to his work, which persistent application was probably the cause of his death at a comparatively early age. Mr. Menelaus, besides being general manager of the Dowlais Iron Works, was largely interested as partner in the Treforest Steel Works, the Tredegar Iron and Coal Company, and in several large collieries. It does not appear, although acknowledged to be a man of great wealth, that he ever invested any of his money in land or houses, his investments being all in those great undertakings which lie at the foundation of the commercial greatness of England.

Mr. Menelaus's first attack of illness was in November, 1879, when he was prostrated by inflammation of the brain. He recovered, but was a greatly shattered man. Yet he resumed his active duties and continued them until another attack, some twelve months ago, imperatively demanded a discontinuance of work. Since that time a constantly varying contest between constitutional vigor and disease has been going on, and it was with extreme regret and profound sorrow that we heard of his death, caused by a recent and severe relapse.

Career of a Notable Mercantile House.

The retirement from business of the old firm of A. T. Stewart & Co. marks an era in the mercantile history of New York. Many of our citizens now in mature life well remember the humble beginnings of the man who afterward became the "Merchant Prince." With small capital, and but little business acquaintance, Stewart ventured to take half of a store on Broadway, opening with a fresh lot of Irish linens just from Belfast. We remember his own jocular description of the pine-board partition that separated him from his nearest neighbor. The short period of 57 years, dating from 1825, has sufficed to witness the culmination, decline and disappearance of the most powerful and prosperous mercantile firm New York has ever had. In the meantime the marble dry-goods palace on Broadway was built on the site of the old Washington Hotel, corner of Broadway and Chambers street, also the six-story building on Broadway and Tenth street—the latter property costing about \$2,750,000—which structures were occupied successively for the transaction of the enormous business of the firm; meanwhile, too, the firm became extensive owners of mill property, for the manufacture of goods sold in the New York warehouse, all of which is now offered for sale. There are included three carpet and woolen mills at Glenham, which are still running; two mills at Leeds, Greene County; one each at Stuyvesant, Columbia County; Utica, Washington Mills, Little Falls, Woodstock, Vt.; Holyoke, Mass.; and Franklin, N. J. Other evidences of accumulated wealth are seen in the chapel and mausoleum at Garden City, L. I., and in the unfortunate "Woman's Hotel," on Fourth avenue, as well as in the beautiful marble mansion, to which Mr. Stewart removed on quitting the less pretentious abode in Bleeker street, with its stable entrance conveniently near to the front door, after the fashion in France. As to the place where the bones of the great merchant lie buried, it can be said, as of those of the ancient law-giver of Israel, "no man knoweth to this day."

It has long been known that Mr. Stewart's successors were not successfully carrying on the business he founded and built up, and that the house had actually declined to a second or third place in the scale of mercantile greatness. Judge Hilton lacked neither capital nor confidence, but he lacked the mercantile ability of Mr. Stewart. His retirement from the unequal contest with difficulties which were too great for him, shows very clearly that A. T. Stewart's success was due to something else than his name, and that he has left no successor who can keep in motion the mighty productive and distributive system which, under his hand, moved without jar or friction.

The Demand for Increased Wages at Pittsburgh.

The Pittsburgh manufacturers who were wickered enough to read the Sunday papers of last Sunday, were treated to a genuine surprise at the announcement that the district convention of the Amalgamated Association, which met at Pittsburgh the day before, had agreed to demand a considerable advance on many of the scales in force in the mills, the demand being from 10 to 30 per cent. This was especially a surprise, as the committee of the association who met the manufacturers a year ago, promised if the demands then made were agreed to there should be no advance asked in the scales then in force, with possibly two exceptions.

The demands covered the price for boiling, muck rolling, scrapping, busheling, old rail piles, faggots, sheet mill knobbling and engineers' scale. The puddlers demand \$6 per ton for boiling iron when the card rate is 2½ cents, instead of \$5.50, the price which ruled last year. The relative gradations are unchanged. The bar-mill hands also demand 10 cents per ton extra on all old rail piles and faggots made into finished iron on bar mills. The sheet-mill scale is to be advanced 15 per cent., and some extra on specialties. The scrappers' scale is to be advanced from \$2 to \$2.25 per ton for piles on boards, and half price for busheling on sand or cinder bottoms; when working sheet iron and swarth, to be \$4.50 per ton. The knobblers now make 2450 pounds to the ton, and they demand that this be changed to 2240 pounds to the ton, the same as other labor. A scale was also decided upon for all rolling-mill engineers, with a basis of \$3.25 per day on the 25-10, with 25 per cent. extra for chief engineer.

On Monday, committees from the Amalgamated Association and the manufacturers met to discuss the demand. In support of this general increase, representative mill men advanced various arguments. The increased cost of living was one of these, and the fact that for some months iron has been sold right up to the 2.5 rate was another. But the principal argument, and the one most persistently urged, was, first, that by far the greater portion of the iron boiled in this city is worked up into extras and specialties, upon which the manufacturers reap large profits; and, second, that \$6 per ton for puddling—the scale upon which all others rest—is no more than has been paid heretofore, viz., in 1868, a period, they claim, when the condition of trade was no better than at present. One other argument, which was used with greater effect at the delegate meeting than it will be with the manufacturers, is that the

wages of puddlers are out of all proportion to those received by other mill workmen. The manufacturers intimated that the demand could not be acceded to, but the conference adjourned to April 28.

We have so often been called upon to criticize the action of the Amalgamated Association of Iron and Steel Workers, that we are all the more willing, and anxious, indeed, to give its officers credit when they refuse to approve of the ill-judged and absurd actions of its members. There have recently been two cases at Pittsburgh in which the officers have summarily ended strikes. One was a strike against the employment of colored puddlers, and the other a strike by some of the puddlers who had been reduced in the grade of their work by reason of making bad iron. In both cases the men were ordered to resume work. In one of these strikes the workmen gave the true reason of the strike, that "they would not work with niggers," but in the other, as is too often the case, a false reason was given, that "they would not work with non-union men." It is in cases like this that the advantage of a union appears, as its power is sufficient to compel the obedience of its unwisely and hot-headed members. It is a fact generally conceded at Pittsburgh, where the Amalgamated is the strongest, that there are not nearly so many petty strikes as there were before the union became strong. When a strike occurs it is a matter of moment, and the petty annoyances that were formerly of almost every-day occurrence are largely a matter of the past.

Enormous as was the emigration last year, the intelligence from across the ocean is to the effect that it will be much greater this year. The ocean steamers are increasing their accommodations, both by enlarging space for steerage passengers and putting new vessels on their lines, and emigrants are crowding their additional accommodations. It is almost impossible to comprehend the volume of this movement to our shores. During the calendar year 1881, the number of emigrants that arrived in the United States was 720,045, being much larger than during any preceding year. Mr. Nimmo, in his report for January of this year, makes some comparisons that give an idea of this immense influx. It exceeded the population of the State of Connecticut by 97,345, the population of Maine by 71,109, the population of Nebraska by 267,643, the population of Vermont by 387,759, the population of New Hampshire by 373,054, the population of West Virginia by 101,588, and the population of Rhode Island by 443,514, and it was less by only 127,417 than the aggregate population of the States of Colorado, Delaware, Florida, Nevada and Oregon. It also exceeded by 113,226 the aggregate population of all the Territories of the United States, exclusive of the District of Columbia.

Those Pittsburgh engines that have been the source of so many newspaper items are again in trouble. First it is a valve chamber that has cracked, then a joint blown out, and not a break somewhere else. Last week but one of the four monsters was at work, and on this depended the water supply of 150,000 people. Engine No. 4 has not been working for nearly two years. Engine No. 3 is completely broken down in consequence of a ruined valve chamber, while No. 2 is useless in consequence of the blowing out of a joint between the check-valve chamber and the valve chamber. According to the statements of Engineer Lowry, the daily consumption of water in Pittsburgh is placed at 22,000,000 gallons. The capacity of engine No. 1, the only source of the city's supply at present, is something like 20,000 gallons per day. It is said, however, that engine No. 2 will be put into shape immediately, but guarding against any possible mishap, the engines at the old water-works have been lubricated, and are now ready to start on a few hours' notice.

The present condition of freights between this country and England, while not absolutely unknown in the carrying trade, is very unusual. It is reported that the steamship lines running from New York to Great Britain are carrying wheat at one cent a bushel, while the Boston lines are carrying Chicago wheat free or paying a cent a bushel premium. This is not from competition, but shipments of freight are so low that this wheat is needed for ballast. The large emigrant trade is sending so many extra vessels to us that it is difficult to get them ballast.

George W. Gill, agent of the Worcester Iron Works, dropped dead in his office, at Worcester, Mass., 13th inst. He was a large owner of railroad property in New England and the West, and a director in the Norwich and Worcester, Chicago and Eastern Illinois, and Rutland railroads. Mr. Gill had been a prominent Democratic politician, and was a member of the Massachusetts State Central Committee for years. He was a delegate to several National Conventions, and was one of the wealthiest men in Worcester.

Iron ore is now being shipped both ways across the Atlantic. "Anything for ballast, and never mind the freight," is the word at present, among the ocean steamship companies.

Horatio Seymour, Jr., late State Engineer of New York, is about locating at Marquette, Mich., as superintendent of the Michigan Land and Iron Company.

The Iron Exchange Movement.

The Iron and Metal Exchange Company have issued the following circular, a copy of which did not reach us in time for insertion in our last issue:

NEW YORK, April 12, 1882.

DEAR SIR: The Board of Directors of the Iron and Metal Exchange Company, Limited, hereby invite you to become an associate of the Exchange.

You are respectfully requested to accept or decline, by addressing me in writing on or before the 21st day of April, instant. In case of acceptance, please sign the paper inclosed and return to me.

Permit me to call your attention to the resolutions of the board, a copy of which you will find annexed. Very truly yours,

EDWIN F. BEDELL, Secretary.

Box 1465, New York P. O.

Following are the resolutions referred to in the preceding:

Resolved, That this board invite to become associates of the Exchange 200 firms, individuals and corporations engaged in the iron or other metal business, as manufacturers, consumers, merchants and brokers; that the condition for admission as an associate shall be the acceptance, in writing, of an invitation to become such, and an agreement in writing to pay the sum of \$75 before the 1st day of May next, for the privileges of an associate from said 1st day of May till the 1st day of May, 1883.

Resolved, That the Secretary mail written or printed invitations to the said parties, and request them to signify in writing their acceptance; and that the non-receipt of such acceptance by the 22d of April shall be construed as a declination to become an associate.

Resolved, That as soon as the time for acceptance has expired, the board will secure such room or rooms for an Exchange as will amply accommodate the number of associates who shall have accepted.

Resolved, That when firms shall become associates, each and every copartner of the firm shall be entitled to the privileges of the rooms; and when corporations become associates, each and every executive officer of the corporation shall be entitled to those privileges; and each associate shall have the right to designate one salaried employee to have the privileges of the rooms, but application must first be made to the board, and such employee must be approved by vote in the same way as if he were a candidate to become an associate.

Resolved, That from and after the 22d day of April, inst., no person can become an associate without an application to be made by him in writing in a form to be hereafter prescribed.

Resolved, That the holding of stock in the company shall not entitle any person to the privileges of the rooms; but such person may become an associate without being voted upon by the board, on complying with the same terms as are required from other associates.

Resolved, That it is the unanimous sentiment of this board that, after the Exchange has gotten into successful operation, the capital stock should be increased by 125 shares; that the privilege of taking the new shares should be given to associates who are not now stockholders; that the wishes of all the associates should be consulted in the selection of such new stockholders; and that each year there should be an increase of the stockholders in a like manner, till eventually all gentlemen in good standing in the trade shall have the opportunity to become members of the corporation.

Following are the names of the parties under whose auspices the Exchange is organized: Thomas Iron Co., Naylor & Co., The Barden Iron Co., J. B. & J. M. Cornell, Cooper, Hewitt & Co., National Tube Works Co., Wm. H. Wallace & Co., Withers, Sherman & Co., Edward Beck & Co., Albany & Rensselaer Iron and Steel Co., E. S. Wheeler, O. E. Schmidt & Co., Lackawanna Iron and Coal Co., B. F. Judson, James R. Thompson & Co., Crocker Brothers, Port Henry Iron Ore Co., David Thomson & Co., Manhattan Iron Works Co., Catsaqua Manufacturing Co., Thomas J. Pope & Bro., Joliet Steel Co., George A. Evans, Abraham S. Patterson, James Williamson & Co., Phelps, Dodge & Co.

The wording of the last resolution in the above circular is considered by the trade as intimating that the members of the company have decided that it is wise to modify in some respects their original plan of organization. We are not informed as to what the company really intend, but it has been stated that they have decided to admit twenty-five other stockholders, and that these fifty will choose another fifty, bringing the total number of stockholders up to 100. The request to accept or decline the invitation in writing, on or before the 21st of April, is not favorably regarded by many in the trade, as it is understood as intimating that those who do not express a desire to join within the time specified will have difficulty in securing admission should they subsequently apply. We do not know that this suspicion has any warrant in fact, but if not, the circular is so worded as to convey a wrong impression. The movement to found an exchange which has been started among the brokers is making good progress. The circular published in our issue of two weeks ago has been favorably received by a great many in the trade, and a good many signatures have been obtained to it. At an informal meeting, held on Saturday last in the office of Mr. Edward P. White, metal broker, 55 Fulton street, New York, forty-seven signatures were shown as having been actually placed upon the paper, and it was promised that within another week the number would be increased to 100. They desire it to be understood that this movement is not intended to be hostile to the Iron and Metal Exchange Company, Limited. It is simply independent of it, and merely carries out a plan proposed by a number of gentlemen in the trade before the committee of nine, which organized the Exchange Company, had been appointed. The signers to the paper propose to organize an exchange open to all applicants on an equal basis of membership and control, and are by no means confined to brokers. The list, when filled, will be found to contain the names of a good many leading houses connected with or di-

rectly interested in the iron and metal trades. The reason this movement is started is simply because those interested in it do not believe that an exchange organized on the principles proposed by the company will be a success, or meet the wants of the trade. They believe that an exchange should be controlled by its members, and that all who do business on its floor should have a voice in the election of its officers and the framing of its rules. Both branches of this Iron Exchange movement seem thus far to have made headway, but whether we shall have one or two exchanges, or none, &c., we should say, still somewhat uncertain.

An adjourned meeting of representatives of the Iron and Metal Trades was held at Delmonico's yesterday afternoon, with reference to organizing an Iron and Metal Exchange. Mr. E. P. White occupied the chair and E. J. Shriver was chosen secretary. On motion, the secretary read a paper setting forth the objects for which they were assembled, some 25 or 30 gentlemen being present during the deliberations. This statement is as follows:

At the meeting of the iron and metal trade held on the 15th of February, the absolute necessity of establishing an Iron and Metal Exchange was recognized, and a committee was appointed for the purpose of arranging the preliminaries. The action of this committee, however, does not meet the intentions originally expressed, for all the steps taken by the same have been toward the organization of nothing more, so to say, than a club, while the wants of the trade require an Exchange founded upon the broadest principles, similar to the other leading exchanges of this city.

In conformity with the institutions of our country, every member of such an Exchange ought to have the right to vote in the election of officers and on other important matters, and everybody whose application is approved by the Board of Managers ought to be eligible to the same.

The object of forming the Exchange, in the first place, is the establishment of fixed rules for the governing of the trade, for it is only too well known that the looseness now prevailing has led to innumerable differences and lawsuits, which otherwise might have been avoided.

Furthermore, the Exchange, by facilitating and concentrating the dealings in goods on the spot, as well as for future delivery, will thereby establish fixed market values. In consequence the banks will be much more ready than they have been heretofore to advance money on warrants for iron and metals, the business will be facilitated, and New York will become the acknowledged center of it. The prosperous condition of the other exchanges of this city and of the iron and metal exchanges of Europe, especially the United Kingdom, are sufficient evidence of this.

The proposition is now made to the meeting to organize the New York Iron and Metal Exchange, the membership of which is to be limited for the present to 200, each member to pay an initiation fee of \$100, and \$25 annual dues. After the 200 members have subscribed, the initiation fee is to be \$500, and the number of members to be admitted is to be fixed by the Exchange. On this basis it is moved that petition be made for the following charter:

Section 1.—That the members of the association known as the New York Iron and Metal Exchange, and all other persons who may hereafter become associated with them, be hereby created a body corporate by the name of the New York Iron and Metal Exchange, with perpetual succession and power to use a common seal and alter the same at pleasure, to sue and be sued, to take and hold by grant, purchase and devise real and personal property for the purposes of such association.

Sec. 2.—The property, affairs, business and concerns hereby created shall be managed by a president, vice-president, treasurer and twelve managers who, together, shall constitute a board of managers, to be elected annually, at such time and place as may be provided by the by-laws.

Sec. 3.—The purposes of said corporation shall be to provide and regulate a suitable room or rooms for the New York Iron and Metal Exchange, in the city of New York, to inculcate just and equitable principles in trade, to establish and maintain uniformity in commercial usages, to acquire, preserve and disseminate valuable business information, and to adjust controversies and misunderstandings between persons engaged in business. The said corporation shall have power to make all proper and needful by-laws, not contrary to the Constitution and Laws of the State of New York, or of the United States.

Sec. 4.—The said corporation shall have power to admit new members, and expel any member, in such manner as may be provided by the by-laws.

Sec. 5.—The Board of Managers shall annually elect, by ballot, five members of the association, who shall not be members of the Board, as a committee to be known and styled the Arbitration Committee of the New York Iron and Metal Exchange, to hear and decide any controversy which may arise between members of the Exchange. The said charter to be taken out after members have joined the association, and a committee to be elected for this purpose, as well as for arranging all other preliminaries.

On motion of Alston Gerry, a committee of five was appointed, to apply for a charter, as follows: E. P. White, M. B. Flynn, A. Ladenburg, Carl Mayer, E. J. Shriver.

A resolution was adopted unanimously, that the draft of charter before the meeting represents the essential objects sought to be attained, and that the committee, as named above, have authority to change it only so far as may be necessary to meet legal requirements.

Moved and seconded, that an election of officers be held May 3d, provided 100 names are first secured. The Chairman reported that the list already had 39 names, and that in all 50 were pledged. Carried.

Mr. Shriver submitted articles of the proposed constitution, which were laid over for further action.

On motion the meeting adjourned to April 26, at the same place, to receive the report of the Committee on Charter, &c.



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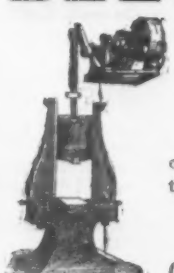
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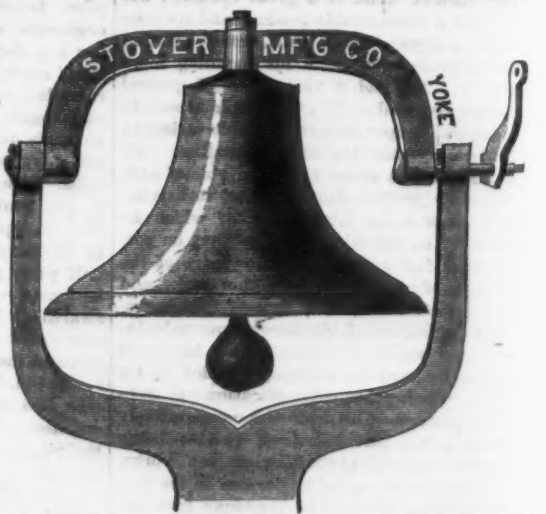
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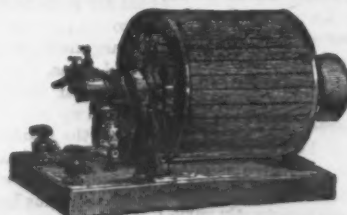
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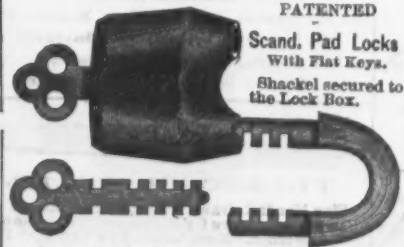
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WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., April 19, 1882.

The Committee on Ways and Means, after full consideration of the business of the House in general and the course of the debate on the Tariff Commission Bill in particular, at a recent meeting determined to proceed to the usual parliamentary forms of closing the discussion on that subject next week. The number of gentlemen who have placed their names on the list of speakers is so large that it would be impossible to have them all heard within that time, accordingly unanimous consent has been given to all members who may desire it to print in the Congressional Record such remarks as they may prepare upon the pending bill.

Mr. Jones, of Texas, was then permitted to print his views. This gentleman regards the bill under consideration as assuming the constitutionality and expediency of a protective tariff, and thinks the policy of protection is now presented under conditions greatly to the advantage of its advocates. So much so, in fact, that its opponents hardly know where to make a stand, or what practical issue to join. He does not think that much reduction of revenue is practicable, for the reason that \$1,000,000,000 will be required to meet pensions and arrearages alone in the next 20 years. He says that during that period the expenses of the Government will average \$350,000,000 a year, and to meet this the present tariff yields \$200,000,000, and the internal revenues \$137,000,000. Therefore, it will be necessary to increase the revenues by tariff or to resort to some financial expedients not now employed. He regards Mr. Hewitt's speech as the standard authority on the free-trade side. As a question between parties, Mr. Jones says, "It is now on the tariff as it formerly was on the question of currency, that the Democratic constitencies are not agreed, and that there is great danger of demoralization and fatal disintegration if the questions involved are not fairly and squarely presented. All are agreed that the tariff should be revised." Mr. Jones then enters into an elaborate opinion on the currency and national banks. The speech very clearly indicates that Texas is fast ranking herself on the side of protection, and Mr. Jones knows it.

Mr. Hubbell, of Michigan, said that he was in favor of the commission proposed by the bill, that the machinery of the system is so thoroughly interwoven with the welfare and life of all our industries that he would favor material or radical change in our tariff laws, or any of their parts, only after the fullest and broadest inquiry into their probable effects. Such an inquiry he did not think practicable by the House in the hurry and scramble of legislation and the hundred conflicting interests which claim attention and time. In support of the policy of protection, Mr. Hubbell then reviewed some of the principal features of its history and the actual fruits of the policy. He then showed that the prohibitory measures of the British Parliament to destroy the infant industries of the colonies was one of the causes of the Revolution, and then gave a succinct review of the operations of the protective system in the United States and the pauperized condition of the European workman. He showed that the results were unparalleled in the history of nations.

Mr. Amos Townsend, of Ohio, spoke of the necessity for a Tariff Commission as the most practical way of accomplishing the end desired. He reviewed the circumstances under which the present tariff laws were passed. He then showed from a summary of petitions presented to the Forty-sixth Congress that 257 firms and corporations, employing 80,867 mechanics and laboring men in these establishments, petitioned the last Congress for a Tariff Commission to revise the customs laws; that they want judicious, equitable tariff laws, and above all, stability and rest from this eternal agitation, which unsettles the business of the country. He said that it is always safe and wise for Congress to listen to and heed an intelligent public sentiment, when respectfully and earnestly presented by petition. In this case their opinions were the results of practical experience, unbiased by political prejudice, and for the purposes determining action were entitled to have great weight and consideration; that the laboring man, especially those who work in the iron mills and other manufacturing establishments, felt a deep interest in this Tariff Commission, and should this bill become a law, he earnestly hoped for them a representation on the commission.

A representative who is directly familiar with the status of the Committee on Ways and Means, remarked the other day that he was much interested in watching the movements of the gentlemen composing that important committee and their views on tariff and other economic questions in the light of five months' experience. He said that it was originally supposed that the committee was overwhelmingly in favor of a high protective tariff, but that such did not seem to be the fact, as each member of the committee placed himself upon the record. For instance, said he, there are only five out of the thirteen members of the committee who can be absolutely classed as high-tariff men; those are the chairman Judge Kelley, Russell Errett, of Pittsburgh, McKinley, of Ohio, Haskell, of Kansas, and Hubbell, of Michigan. The ex-Speaker, Mr. Randall, while in favor of a tariff, is too much of a disciplinarian to ignore the potential dictation of his party, so that while he will always be found on the tariff side of the line in debate, he will not have any serious controversy with his colleagues. Mr. Spear, of Georgia, appears in the same category, or, as the party of the first part designated it, they are protective tariff champions after a fashion. Neither of them are likely to split with their party should its mandate declare protection unconstitutional, tariff for revenue only the true theory of the powers of Congress to levy duties, or free trade as for the best interests of the majority. The course of Mr. Dummell, of Minnesota, is well known, and was a surprise to everybody. It required no ordinary elasticity of political conscience to masquerade as a protective-tariff candidate for speaker, and as such to get on the Committee of Ways and Means, and upon the first opportunity to flop over

as a full-fledged free trader. Mr. Russell, of Massachusetts, a large manufacturer and dealer in paper, is for protection, but wants nothing done to fortify that important interest. Mr. Kasson, of Iowa, who is so dexterously engineering the Tariff Commission bill, is with the majority and very adroit in managing his affairs in this particular. During this discussion, when Hewitt resurrected some of his anti-protection speeches in 1866, after considerable wriggling, finally, as the expression goes, "acknowledged the corn," and admitted that in the broad day of full information on the subject, he now conceded that protection of American manufactures and labor was the true policy of this Government. In addition to the Republican Dummell, the Democrats Tucker, Carlisle and Morrison, are unrelenting free traders. This is the inside view of the Committee of Ways and Means as it stands to-day.

Mr. Poindexter Dunn, of Arkansas, continuing the discussion, prefaced his harangue with a Biblical quotation which, presumably, he regarded as a Hebraic indorsement of his position, to wit: "And now, whereas, 'the fathers' did lade you with a heavy yoke, we will add to the yoke. Whereas, 'the fathers' hath chastised you with whips, we will chastise you with scorpions." He then launched out, basing his opposition on the ground that the bill was unconstitutional in its spirit and purpose; unnecessary, in fact, and strategic, cunning and evasive in its motives. He believed it full of mystery, jugglery, unseen results and delusions. This was the burden of his story. He also congratulated the country upon the indirect opportunity which the bill afforded for a general discussion of the subject of tariff taxation, and for a general review of our own tariff system. He thought that it was well for the attention of the country to be drawn to this subject at once, being satisfied that when once the American people are brought to closely and dispassionately scrutinize the pernicious and iniquitous protective system, in his opinion they would brush it away like a cobweb, and provide in its stead a constitutional system of tariff revenues. He thought when the tariff is investigated in the light of the constitution it will be found now to be without constitutional warrant, and when viewed in the light of a wise economic national policy, he charged it would be unwise and unsound. He continued by declaring that any foundation upon which the present high protective system was built has been withdrawn, and that there is no reason in continuing it to plague the people. Having begun with the Bible he wound up with poetry.

So his spoilers come not singly,
But as if they watched and waited;
First the tariff, then the railroads,
Futures, corners, then the bankers,
* * * gathering flock-wise
Round their victim, sick and wounded,
Till the air is dark with anguish.

Mr. Columbus Upson, of Texas, next ventilated his views in support of a revision and reduction of the tariff to a revenue basis, and quoted the language of members of the Senate and House in support of the doctrine. He denied the power of laying and collecting taxes to aid or to give protection *per se* to private industries. He said free trade meant direct taxation, and showed that internal or direct taxation has been an unpopular measure, and generally avoided to meet extraordinary emergencies. To raise the principal revenue of the Government for the support of the Government by duties on imports, by tonnage, and the sale of public lands, has been so long in force that it has become the time-honored and settled policy of the Government. Mr. Upson then gave the wise injunction that should the representatives of the respective States of this Union carry the legacy of free trade and direct taxation home to their people as the fruits of their labors, political obituaries would be the order of the day all over the land. He was for revenue with incidental protection.

Mr. Updegraff, of Ohio, followed in an elaborate and forcible speech in favor of the commission, and showing the importance of a revision of the tariff to meet the demands of modern values and changes in commercial terms.

Mr. Turner, of Georgia, said the bill was a concession of the necessity for a revision of the tariff, but under the present necessities of the Government, absolute free trade would be impracticable; that if we did not have a debt of two thousand million dollars and a pension roll to meet, he would be in favor of unrestricted commerce, and argued in support of this proposition.

Mr. Armfield, of North Carolina, representing one of the worst "moonshine" districts in the country, said that he desired to make their grievances known. He charged that the internal revenue laws are burdensome and oppressive upon two of the greatest industries of the country, the production of spirituous liquors and tobacco; they create an army of spies obnoxious to the people. He then gave the tariff a whack as unjust and unequal in its burdens, a clog on industry and a fetter on commerce. This speech was a general tirade against the internal revenue laws because his constituents were compelled to comply with them, and the tariff because it protected American manufactures and industries. Like Dunn, of Arkansas, he quoted the bible as pronouncing a fearful judgment on the rich man, who slew the poor man's only pet lamb that he might spare his own numerous flock.

The entire session of the House of Representatives on Saturday being devoted to the discussion of the Tariff Commission Bill, John D. White, of Kentucky, took the floor and consumed most of his time in an assault upon the House bill, recently passed, amending the internal revenue laws.

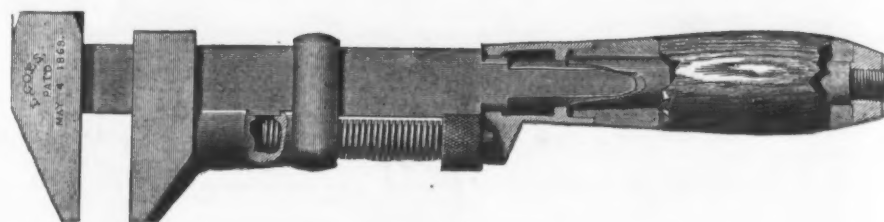
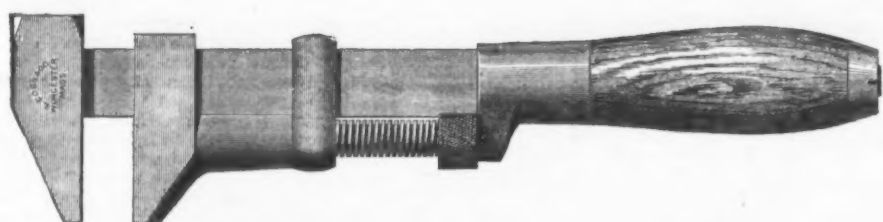
Benton McMillan, of Tennessee, desired to know, if Congress begins this work of shirking responsibility and shifting it upon civilians not chosen by the people nor authorized by the Constitution, where will it stop? He was, therefore, opposed to the bill, demanding that whatever action is taken on the tariff it should be by Congress. He then paid his respects to a high tariff in the stereotyped style that it taxed everybody in the land to increase the profits of the rich manufacturer, and even put a tax on bibles, thus prohibiting the plan of salvation from going untaxed to the people. He preferred the representatives of the people to make any

L. COES & CO.,

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ESTABLISHED 1839.



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We make the shank of our wrench about **double** the size of those in other screw wrenches, leaving it **full size**, and **strength** by **not** cutting a thread.

Our Ferrules are made with **two** bearings, **both** fitting the shank.

An Iron Tube of sufficient strength to resist **any** pressure that may be put upon it, is fitted to the shank, one end resting against the lower bearing in the ferrule, the other against the enlarged **Tip** or **Nut** at end of handle, all **rigidly** held in position, the wooden handle made to fit exactly over the Iron Tube, forming a **solid** combination of Wood and Iron, preventing any possible displacement of the ferrule from hard usage. All our Wrenches are made with **straight Bar**, full size, the **extreme length**. The Jaw is made with **ribs** on the **inside**, running full length of the Jaw, which, in connection with the projecting sides, both secured by patent, are fully equal to any strain the Bar may be subjected to. We have also enlarged the barrel of the Jaw to take a **larger** and **longer** screw, enabling our Wrench to accommodate a larger Nut than any other manufactured. We make our goods of the very best material, thoroughly case-harden, and warrant every Wrench.

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Warehouse, 97 Chambers and 81 Reade Streets, NEW YORK.

DURRIE & McCARTY, Sole Agents.

CHAPLIN'S PATENT

TRY SQUARE AND MITRE, SPIRIT LEVEL AND PLUMB.

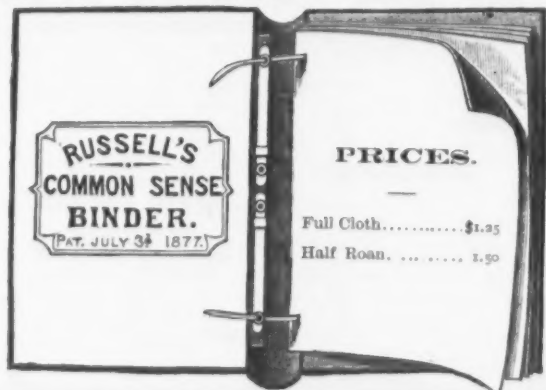
A CARD.

This Tool is manufactured under the original patent granted O. H. Chaplin, May 8, 1866, reissued May 4, 1880, for a Combined Square and Bovel, having an adjustable or sliding blade drawn to its seat by a clamp bolt. The public are hereby cautioned against the sale or use of a similar tool made and put into the market by another party, fraudulently claiming the invention as his own, under the name of "Starrett's Patent Adjustable Square." Proceedings in the U. S. Court for the District of Massachusetts were commenced against said party for infringement of the Chaplin Patent in July, 1880, and a final hearing was reached at Boston the second week in January last. The case now only awaits the arguments and decision of Judge Lowell. The aforesaid pretended inventor has recently commenced a counter suit against us, apparently for the express purpose of trying to frighten dealers by threat of suit for damages from handling the Chaplin Tool. All we have to say to the trade in this matter at present is, that we shall firmly maintain whatever rights the Courts may establish in our behalf, and shall protect and defend all parties whomsoever in the use and sale of the Chaplin Tool manufactured by us.

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Fine Mandrel drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEAKIN & CO., 500 N. 12th St., Philadelphia, makers of the American Improved Brass Garden Syringe.

IMPORTANT CORRECTION TO

"A CARD TO THE WRINGER TRADE,"

Issued by F. F. Adams & Co., "Limited," in last week's Iron Age.

IT SHOULD HAVE READ

"WE HAVE MET THE ENEMY AND WE ARE THEIRS."

Understanding that F. F. Adams & Co., Limited, were intending to put upon the market the Wringing Machine called "America," we endeavored, through our traveling agents, to obtain the legal proof upon which to file a bill of complaint, alleging that the same was a serious infringement of some of our patents. Being unable to procure such evidence on account of the unwillingness of persons who had purchased such machines to testify to the fact, we were compelled to issue the notice printed by F. F. Adams & Co., Limited, in their "Card to the Wringing Trade" of last week.

The Circuit Court of the United States, Judge Wallace presiding, at the city of New York, on Saturday, April 8, 1882, required that the complainants, F. F. Adams & Co., Limited, should in open court stipulate "that a certain Wringing Machine marked 'America' on the frame, and marked upon one of the rolls 'Exhibit A, Adams Wringer, America, April 8, 1882,' is a specimen of Wringing Machines manufactured and sold by them," said complainants, "and which they are now manufacturing and selling," to the end that we might have the undoubted legal proof upon which to found any suit for infringement.

F. F. Adams & Co., Limited, were compelled to comply with this order, and we have accordingly commenced two suits for infringement.

There is not one word in the decree prohibiting us from suing any person or persons who buy or sell Wringing Machines that infringe our patents.

F. F. Adams & Co., Limited, forget that Mr. Macbeth, who with courageous profanity requested Mr. Macduff to "lay on," finally got the worst of it, and was himself "laid out."

Our customers and licensees may be assured that we shall protect our patent property against infringements.

METROPOLITAN MANUFACTURING CO.,
BAILEY WRINGING MACHINE CO.,
PEERLESS WRINGER CO.

The Best Wrought Iron

R A K E S

ARE MADE BY

WHEELING HINGE CO., Wheeling W. Va.

proposed revision rather than an "irresponsible commission" to go junketing about the country in order to teach Congress what to do.

Mr. W. S. Shollenberger, of Pennsylvania, spoke at some length in favor of the bill and, representing an important manufacturing constituency, showed by facts within his own knowledge that tariff revision is an absolute necessity, and he believed that revision should be in the interest of protection of American manufactures and labor.

Mr. John Hill, of New Jersey, thought the Tariff Commission Bill was the only method for a revision of the tariff which could be adopted which would satisfy all parties interested. He said that the cry of alarm by the free-trade speakers because the trade balance is in favor of Europe, is not to be found in the tariff, but in speculation and corners in the produce exchanges, which are doing incalculable injury to Western farmers, while protection is furnishing inducements for immigration, in that it provides the opportunity for the payment of higher wages to the operatives, and thus establishes a daily increasing home market which is infinitely better than a foreign one for our Western brethren. Mr. Hill then entered quite elaborately into the question of labor in the United States, and showed its dependence upon the fostering care of protection. He then gave a comparative statement of weekly wages in Germany and the United States: Bricklayers, Germany, \$3.45; New York, \$12 to \$15; Chicago, \$6 to \$10.50, and the same proportion in the trades generally. In the matter of food prices, he showed that the difference was not in the same proportion. For instance: Bread per pound, Germany, 3 to 7 cents; New York, 4 to 4½ cents, and same in Chicago; roast beef, Germany, 22 cents; New York, 12 to 16 cents; Chicago, 8 to 12½ cents, and so in all matters; thus showing that while the price of labor was lower, the price of food is really higher. He then showed by consular reports the condition of German labor. Mr. Hill also showed the same thing in the relations of labor with reference to Denmark, Belgium, Italy, France and England.

Mr. Benjamin Wilson, of West Virginia, said that the question is not one of protective tariff nor of tariff for revenue only, but simply a means proposed of obtaining the necessary information upon this great economic question to enable Congress to legislate intelligently upon the tariff, and with justice to all interests. He thought it was the most expeditious plan that could be adopted, as there are men who have devoted their lives to these questions, and what the country needs is information that can only be obtained by experts. He then took up the Wood tariff bill, showing that it had been framed or acquiesced in by a committee of the speaker's own choosing. It was sustained on the floor by some of the able men who now oppose this bill, and yet that same Wood tariff bill fell so far below the demands of the people, was so obnoxious, that a House of the same political creed with the framers of it struck out the enacting clause and killed it. He said if the revision of the tariff is so easy, he would ask his Democratic friends upon the floor why it was that during the six years they had control there such revision was not made. He then showed that the Morrison bill shared the same fate from the same causes. The entire speech, in place of theories and platitudes, was filled with the question from a sound practical standpoint.

Mr. William Ward, of Pennsylvania, would support the bill, because it was founded upon correct principles. He very effectively exploded the beautiful speculations of Mr. Carlisle, showing that while in 10 years of high protection wages increased over 33 per cent., the profits of capital decreased nearly 1½ per cent. He then gave a comparative statement of prices of labor in the United States and Europe, already referred to in the speech of Mr. Hill, of New Jersey, and showed that the habitations and home life of the working people of Europe are such as to excite our deepest commiseration. Low wages, long hours of toil, high prices for necessities, make it a hand-to-hand struggle for existence. He then compared the American workingman's home, and concluded with the declaration that protection is the safeguard of the American workingman's wages. Representative Kasson, in charge of the tariff bill, is urging such members as desire to speak on this subject to be present, so that the discussion may be concluded at the very earliest moment. In conversation today, he observed that he could see no reason now why the debate could not close next week. At least he will strive to that end.

SPRAYED HOOP IRON.

The following is the text of the decision just rendered in the sprayed hoop iron case:

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
WASHINGTON, D. C., April 13, 1882.

Collector of Customs, New York.—SIR: The Department is in receipt of your letter of the 17th ult., submitting the appeal (No. 9972 G) of John S. Long from your assessment of duty at the rate of 1½ cents per pound on certain hoop iron imported by him per Republic, January 3, 1882. The merchandise is hoop iron cut to specific lengths for barrel hoops, punched at one end, and is sprayed to fit the parts of the barrel for which it is intended. The appellant claims that it is dutiable at 35 per cent., as a manufacture of iron not otherwise provided for. Except in being sprayed, the merchandise differs in no respect from the hoop iron cut and punched, which, by Decision 4496, is held to be dutiable as hoop iron. The article, as imported, not being a complete hoop, it comes within the principles of the decision cited, and is to be regarded as hoop iron. Your decision is therefore affirmed. Very respectfully,
(Signed) CHAS. J. FOLGER, Secretary.

Mr. Long, the appellant in the sprayed hoop iron matter, having lost his case, now asks the Secretary of the Treasury to allow him to be heard by counsel. It is not likely that the request will be granted, and this question may be regarded as definitely disposed of.

FORGED AXLES.

The Secretary of the Treasury has the forged axle case now before him and will prepare his decision in a few days. All the

data carefully collated is presented, so that no unusual delay need be expected.

THE SIEMENS PATENT.

The House Committee on Patents have commenced the hearing in the matter of the petition of Charles, William and Frederick Siemens, for authority to make application to the Commissioner of Patents for the extension of their patent for a regenerative furnace. The memorials and affidavits in support of the petition are quite voluminous. The memorialists, agents of the patentees of the Regenerative Gas Furnaces, for which Letters Patent of the United States were first granted on the first day of March, 1864, and numbered 41,788, declare that they believe that the extension of the patent, as prayed for by the patentees, would be beneficial to the users of the furnace, in accordance with the policy of the patent laws, and an act of simple justice to the petitioners, for the following reasons:

1. The invention was new and useful when patented.
2. The invention is valuable and important to the public.
3. The inventors have not been reasonably remunerated for the time, ingenuity and expense bestowed upon it, and the introduction of it into public use, and this failure to be so remunerated has not arisen from neglect or fault on their part.
4. The effect of the proposed extension will not be detrimental to the public interests; on the contrary, its effects upon the public interests, it is believed, will be highly beneficial.

These reasons are the only ones which have been heretofore considered by the Commissioner of Patents and by Congress in extending patents, and if established by competent testimony, it has always been held that the patent should be extended, even if the original term should have expired. They then quote largely from a number of scientists and scientific works to show the great economy of fuel and other advantages of this patent as follows:

1. Saving of waste in the metal treated.
 2. Economy in fuel.
- The Siemens furnaces, they claim, realize a larger economy in fuel than that above considered; in another way it uses the cheapest fuel, such as "slack" coal of mines which was absolutely thrown away by the 100,000 tons before the introduction of this furnace. It uses as much as 25 per cent. of the sweepings of anthracite coal yards, mixed with 75 per cent. of slack bituminous coal. It uses decrepitated anthracite and bituminous shales, which are unfit for other purposes; also peat, slabs and saw dust. There is not any known fuel so bad that it cannot make usable gas for the Siemens furnace, if it is properly treated in a suitable producer.

In view of all the facts the following memorialists, who are simply users of the invention covered by the patent sought to be extended, and who own no undivided or territorial interest therein, express the opinion that public policy, as well as justice to the applicant, suggests that the patent should be extended as prayed for by the patentees: Otis Iron and Steel Company; Cleveland Rolling Mill Company; Jos. H. Brown Iron and Steel Company; National Tube Works Co.; Nashua Iron and Steel Co.; Anderson & Co.; Delaware Iron Co.; Morris Tasker & Co.; Joliet Steel Co.; Bolton, Bulley & Co.; Bay State Iron Co.; St. Alban's Iron and Steel Works.

The case will be continued on Thursday. Remonstrances against the extension have been received from Pittsburgh, Cincinnati, Harrisburgh, Pa., Youngstown, Ohio.

Activity Among the Ironworkers of San Francisco.

All the machine shops and iron foundries of San Francisco are now working full time. Several of them are compelled to keep running overtime. The principal manufacturers report that the iron business is more prosperous at present than at any time for the past ten years. The bulk of the business appertains to the manufacture of mining machinery. One firm is constructing a 10-stamp mill, 2 engines, with 10 x 20-inch cylinders; 6 amalgamating pans, with boilers and settlers for, Mexico. It is also making a 20-stamp mill, a Corliss engine, with 18 x 42-inch cylinders; four boilers, 54 inches by 16 feet, with pans and settlers, for the Hastings Company of Arizona; a 20-stamp mill for the Total Wreck Company of Arizona; a Corliss engine, with cylinders 20 x 48 inches, 4 boilers 4½ x 16 feet, 14 5-foot amalgamating pans, 7 8-foot settlers, shafting, &c. For the Santa Marie mines of Mexico it is building a 60-stamp mill, two Corliss engines, with cylinders 24 x 48 inches, 6 boilers 4½ x 16 feet, 36 5-foot amalgamating pans, 18 5-foot settlers and 4 rock breakers, with shafting and everything necessary for the plant. It is also building a boiler for the steamship Empire, 12 feet in the clear. The firm's orders at present awaiting execution amount to \$250,000. This firm employs 300 operatives and disburses \$20,000 a month in wages. Another firm employs 250 men, sometimes more and sometimes less, and disburses in wages from \$30,000 to \$10,000 a month. Orders are received from Arizona, New Mexico, Colorado, Montana and Idaho. This firm makes a specialty of manufacturing furnaces for smelting copper, in which branch of business it reports more activity than at any time before. A third firm has 400 men employed, who earn on an average \$3 a day. A fourth firm employs from 400 to 600 men, and pays \$45,000, and sometimes more, a month in wages. It has large orders on hand for mining and ship machinery, for sugar works and steamboat boilers in the Hawaiian Islands. All its shops, the superintendent states, are running full time, and it is extending its business facilities, having recently expended \$100,000 on workshop extensions. Altogether there are about 1900 men employed in the metal works of the city, earning from \$2 to \$4.50 a day, or an average of, say, \$3. There is, consequently, about \$34,200 distributed weekly among the metal workers of San Francisco.—*San Francisco Bulletin.*

A number of warrants are out for the arrest of persons connected with the recent Homestead troubles among iron-workers near Pittsburgh.

Structural Steels.—III.

BY ALBERT F. HILL, C. E.

INFLUENCE OF MECHANICAL TREATMENT.

Of even greater importance to the engineer than the knowledge of the effects of chemical composition, is the knowledge of the effects produced upon steel by different forms of mechanical treatment, such as hammering, punching, shearing, annealing, tempering, &c. The effects of such treatment are, in most cases, so decisive in their influence upon the mechanical properties of the material, as to completely controvert the conclusions and expectations based upon chemical analysis; that is, if, for instance, this latter, or even actual physical tests, have shown us, that we have a mild steel of great ductility to deal with—subsequent shop manipulation may change it into a hard, brittle and unfit material for construction, and vice versa—mechanical treatment may be successfully called to our aid in correcting certain undesirable properties due either to chemical composition or to previous mechanical treatment. This also enables us to meet most readily certain peculiar requirements of steel construction, and puts into our hands the means of equalizing the service of different grades.

INFLUENCE OF ANNEALING.

The operation of annealing is, of all forms of mechanical treatment, the one of greatest importance to the engineer. Its effects are marked by a reduction of the elastic limit and ultimate strength, and an increase in the ductility of the steel. In this way we can, therefore, counteract the effects of local hardening, caused by punching, cold-hammering, &c. Annealing also enables us to make use, in construction, of steel otherwise too high in carbon, by increasing its ductility to the required standard. Tests made by the writer and contained in the following, Table VII, show the effects of annealing on steel bars. The test pieces—30 inches long, leaving 12 inches clear between jaws of testing machine—were cut from both ends of bars, which were subsequently made into eye-bars. As it was desirable to find out how much of the loss in strength of the manufactured eye-bar, as compared with the original bar, was due to annealing after forming the eyes, and how much of it was due to this process of making the eyes, alternate test pieces were annealed in the same manner as were subsequently the eye-bars, viz., heated slowly to a dark red heat and then quickly covered with fine ashes so as to prevent too rapid or unequal cooling:

TABLE VII.—"OPEN-HEARTH" STEEL BARS, DESIGNED FOR EYE-BARS, ANNEALED AND UNANNEALED.

Carbon.	Size.	Mark.	Unannealed.		Annealed.	
			Elastic Limit.	Average tensile resistance of 5 test pieces, in lbs. per square inch of section.	Elastic Limit.	Average tensile resistance of 5 test pieces, in lbs. per square inch of section.
0.30	3 x 1½ in.	C ₁	55,635	95,390	44,313	94,600
0.40	3 x 1½ in.	D ₁	59,693	100,750	49,087	94,600
0.50	3 x 1½ in.	E ₁	65,994	111,630	54,334	100,390
0.60	3 x 1½ in.	F ₁	71,630	118,630	59,087	100,390
0.70	3 x 1½ in.	G ₁	77,630	125,630	64,087	100,390
0.80	3 x 1½ in.	H ₁	83,630	132,630	69,087	100,390
0.90	3 x 1½ in.	I ₁	89,630	139,630	74,087	100,390
1.00	3 x 1½ in.	J ₁	95,630	146,630	79,087	100,390
1.10	3 x 1½ in.	K ₁	101,630	153,630	84,087	100,390
1.20	3 x 1½ in.	L ₁	107,630	160,630	89,087	100,390
1.30	3 x 1½ in.	M ₁	113,630	167,630	94,087	100,390
1.40	3 x 1½ in.	N ₁	119,630	174,630	99,087	100,390
1.50	3 x 1½ in.	O ₁	125,630	181,630	104,087	100,390

The effects of shearing, punching and hammering of steel, as will be hereafter more fully shown, are marked by an increase in the hardness of the material extending over a more or less well-defined area, immediately surrounding the points at which these operations were performed, thus raising the elastic limit in these places and impairing the homogeneity of the material. The great corrective of these bad effects is annealing.

In a series of experiments conducted at Chatham a few years ago, eight plates ½-inch thick were taken, and four holes ½-inch diameter were punched in each. The plates were then cut in two, so that each plate made two test pieces, one only of which was annealed. The whole sixteen pieces were then tested for ultimate tensile resistance; the unannealed ones giving an average of 42,194 pounds per square inch of section, whereas the average of the annealed ones was 65,678 pounds per square inch of section, being an increase of 22,484 pounds per square inch, or 55.66 per cent. It will be observed from Table VIII that the annealed plates showed a much greater uniformity in strength than the unannealed—the difference between the two extremes in the one being 10,832 pounds, as against 18,744 pounds in the other. It is to be regretted that no tests were made to ascertain the original strength of the plates, so as to furnish an indication of the amount of deterioration due to the punching, and the amount of restoration effected by subsequent annealing. Neither do the tests give an analysis of the steel nor a statement of its mode of manufacture.

TABLE VIII.—ANNEALING TESTS OF STEEL PLATES.

Mark.	Size of test piece.	Tensile breaking strain per sq. in.	
		Annealed.	Unannealed.
1A.....	2.28x.475	66,000	38,780
2A.....	2.28x.475	66,000	38,780
3A.....	2.28x.475	66,000	38,780
4A.....	2.28x.475	66,000	38,780
5A.....	2.28x.475	66,000	38,780
6A.....	2.28x.475	66,000	38,780
7A.....	2.28x.475	66,000	38,780
8A.....	2.28x.475	66,000	38,780
9A.....	2.28x.475	66,000	38,780
10A.....	2.28x.475	66,000	38,780
11A.....	2.28x.475	66,000	38,780
12A.....	2.28x.475	66,000	38,780
13A.....	2.28x.475	66,000	38,780
14A.....	2.28x.475	66,000	38,780
15A.....	2.28x.475	66,000	38,780
16A.....	2.28x.475	66,000	38,780
17A.....	2.28x.475	66,000	38,780
18A.....	2.28x.475	66,000	38,780
19A.....	2.28x.475	66,000	38,780
20A.....	2.28x.475	66,000	38,780

*Transaction Inst. of Naval Architects.

Table IX gives the results of a series of 75 tests made of open-hearth steel plates of different carbon percentages. The original plates were throughout of ¾ inch thickness and 18 inches in width. All the specimens were cut out crosswise to the direction of rolling, simply on account of greater convenience in handling, and as long as they were all taken in the same direction, the direction to the rolling could have no influence on the comparison of the results. Size of specimens in clear between jaws of testing machine, ¾ x 2 x 12 inches.

TABLE IX.—ANNEALING EFFECTS ON SHEARED AND HAMMERED O. H. STEEL PLATES.

Carbon, per cent.	Treatment of test pieces.	Average tensile resistance of 5 test pieces in lbs. per square inch of section at		Per cent. elongation.
		Elastic Limit.	Rupture.	
0.30	Specimens cut in planer.....	45,170	86,730	19.1
0.30	Specimens sheared out.....	31,290	69,376	11.3
0.30	Specimens sheared out and annealed.....	44,830	84,950	20.9
0.30	Specimens hammered cold, then cut out in planer.....	63,720	85,380	3.4
0.30	Specimens as above and annealed.....	46,360	83,970	16.8
0.40	Cut in planer.....	53,640	89,880	16.4
0.40	Sheared out.....	41,250	75,400	8.3
0.40	Sheared out and annealed.....	51,470	86,320	16.7
0.40	Hammered cold, then cut out in planer.....	64,180	87,560	2.3
0.40	Hammered, annealed, then cut in planer.....	51,710	85,890	14.1
0.50	Cut in planer.....	62,070	93,210	11.4
0.50	Sheared out.....	49,960	82,930	5.2
0.50	Sheared out and annealed.....	59,390	98,560	12.0
0.50	Hammered, then cut in planer.....	71,630	91,810	0.7
0.50	Hammered, annealed and cut in planer.....	65,120	90,620	8.1

While there is no doubt of the beneficial results obtainable from careful annealing, it must be conceded on the other hand that this treatment is liable to do more mischief than good, unless properly performed. Great care must be exercised in the heating, in order to prevent oxidation or partial decarburization. It ought, whenever possible, to be performed in a gas furnace, so as to avoid all actual contact with the fuel itself, and at a temperature higher than that at which the steel has been previously worked. This will, in most cases, be accomplished by a temperature not much higher than is required for heating to cherry-red. The cooling ought to be as slow as possible, and contact with the air avoided. These conditions would require for their strict fulfillment, in the annealing of large masses, such an extension of plant and labor as to materially affect the cost of the steel. The main question to be solved is the construction of a suitable annealing furnace, capable of receiving the long pieces, such as eye-bars, &c. The cooling need not necessarily be done in a close chamber, as steel after being heated can be taken out and quickly covered with dry sand or lime, which will answer all purposes. Collecting opinions on the Clyde and in England, it was found that for ship plates the same steel in one yard, simply heated to a black-heat, and in the other yard to a cherry-red, was reported to yield the same result; and that, therefore, a low temperature—say of molten lead—would be sufficient for all purposes. The expense of a lead bath, involving scarcely any consumption of that metal, would be only a trifling increase to a plant, the more so since the heat communicated by molten lead is instantaneous, and limited to an unvarying temperature, while a coal furnace is less certain and much slower. Mr. E. Ede, though, who has large experience with this metallic bath—E. Ede's "Management of steel, &c."—says he experienced ill effects from metal heated to this temperature, and avoids having recourse to it except in cases of necessity. Experimental demonstration of the effects in annealing of various temperatures, more or less rapidly applied, and under different conditions of cooling, are very much needed on this subject.

THE WELDING OF STEEL.

One of the most serious obstacles that confront us in the adoption of steel for purposes of bridge and other construction, is the distrust of its welding capacity. That distrust is founded far more upon prejudice than upon fact is becoming more and more apparent, with a clearer perception of the difference in the methods of working iron and steel. Again the "carbon line" becomes our guide, and we soon find that the weldability of steel is in inverse ratio to the carbon percentage—that is, the facility with which steel may be welded to steel, diminishes as the metal approximates to cast iron with respect to the proportion of carbon; or, what is equivalent, it increases as the metal approximates to wrought iron with respect to the absence of carbon. Nevertheless, steels far in excess in carbon percentage of any that can ever be used in construction, have been successfully welded by proper treatment.

At the Philadelphia Exhibition, the Swedish Sandvik Company showed a series of steels which had the following welding qualities:

Carbon..... 0.30
A file containing 1.00, welded to steel containing 0.30
A boiler " 0.75, " " " 0.30
A boiler " 0.75, " " " 0.30
A boiler " 1.25, " " " 1.00
A boiler " 1.00, " " " 1.00
A boiler " 0.90, " " " 0.90
A boiler " 0.80, " " " 0.80

These steels were of the ordinary quality used at the works, and the welded pieces being polished at the place of welding, showed in every case that the union was perfect.

From a paper read before the Liverpool meeting of the Iron and Steel Institute, 1879, by Mr. Ratcliffe, of the Mersey Steel Works, we learn that he has succeeded in welding mild Bessemer steel forgings, without any flux, in the same way as ordinary iron. This metal before welding showed to analysis:

Carbon..... 0.53
Phosphorus..... 0.09
Silicon..... 0.06
Manganese..... 0.78

To prove the soundness of the weld, a piece of

the bar 3½ inch diameter was severely punished under a 5-ton hammer, and only broke with the twenty-ninth blow, showing no weakness where the welding had taken place.

Experiments have proved that steels having approximately the following composition, weld easily:

Carbon..... 0.15 to 0.30
Sulphur..... 0.03 to 0.05
Phosphorus..... 0.05 to 0.10
Silicon..... 0.10 to 0.15
Manganese..... 0.25 to 0.40

This composition is exactly suited to tension members in structures.

In further illustration of the capability of mild steel for being welded, Kern states—*Chemical News*—that to steel ship plate 2 feet wide x ¾-inch thick; a steel plate, 2 x 2 x ¾ inches, was easily welded and a good joint was received. In another steel, strips 6 x 4 x ¾ inches, containing 0.25 to 0.26 per cent. carbon were welded together; very often after cooling the plate was bent double, through the weld, without the least fracture in or near the welded part.

To prevent decarburization and to render the welding places perfectly clean, various welding powders have been recommended, but have never come largely into use—for, after all, a good and clean weld, be it in iron or steel, depends upon the skill and the intelligence of the blacksmith. Unfortunately the latter is only too often dogmatic and obstinate; "knows all about steel," and therefore cannot be taught anything. If the steel-maker has furnished the constructing engineer with otherwise good steel, that, somehow or other, "will not weld," the latter will probably discover the source of the trouble in the blacksmith shop. Lieutenant Barba, in his book on "The Use of Steel," relates a characteristic incident in his experience during the construction of the steel ships before referred to, which is quite in point. The blacksmiths intrusted with the work of bending steel plates and angles wanted to treat them like ordinary iron, and persistently violated instructions. After several cases of rupture had been observed, these men were replaced by carpenters, inexperienced in taking care of a fire, and, not "knowing all about it," were therefore disposed to pay the closest attention to the instructions received. They completely succeeded without a single failure, and there was an end to "the trouble with the steel."

There is one point in welding steel which cannot be too strongly insisted upon, and that is that the pieces, after having been brought to welding point, should not be struck heavily with the hammer, but only tapped lightly at first, until they have begun to weld; after that the sledge or steam hammer may be used with perfect freedom.

The Threatened Wringer Infringement Suits.

Under the heading of "Infringement Suits Against Dealers," in our last issue, we made the mistake of giving the injunction obtained from Judge Wallace by F. F. Adams & Co. against the Wringer Combination a somewhat wider scope than its wording warrants. The respondents were not restrained from suing any one they may choose to consider a party to the alleged infringement of their patents, whether in the manufacture or sale of such infringement. In other respects our statements were correct. The injunction provides in effect as follows: "It is hereby ordered that an injunction may issue against said respondents and each of them, restraining them and each of them, their agents, servants and attorneys from issuing by mail, or publishing in any manner, or handing, or delivering to the public or any private individual, the circular complained of and set forth in said bill, or any colorable form thereof, intimating or threatening the public, or any private individual, or firm, or combination of individuals against the use or sale of the clothes wringer described in said circular, and marked and known as the 'American,' until the further order of this Court. This injunction is granted on condition that the complainant, F. F. Adams & Co., Limited, stipulate that a certain wringer machine, marked 'America' on the frame

is a specimen wringer machine, manufactured and sold by them, and which they are now manufacturing and selling." In other words, the Wringer Combination is enjoined from issuing to dealers circulars menacing and threatening infringement suits against those selling the wringers made by F. F. Adams & Co., on condition that the latter company acknowledge that they are making the machine alleged to infringe the patents owned by the combination, with a view to making it as easy as possible for the combination to sue them without the necessity of obtaining proof of the alleged infringement through or from the dealers. Our favorable comment on Judge Wallace's decision was based on the fact that his order restrained the further circulation of printed threats to sue dealers for infringing their patents. We think the position taken on this point is evidently a just one, as menacing of dealers has been carried too far in a great many cases, and often by people who had no intention of bringing suits, but merely wished to injure the trade of a competitor. We understand, however, that no court has the right to enjoin any one from bringing a suit against any other person whom he may have a legal right to sue, and in stating that Judge Wallace had so decided, we inadvertently made a mistake. The representatives of the wringer combination have already begun two suits against F. F. Adams & Co., and will, we presume, press them to a decision. Messrs. F. F. Adams & Co. are certainly in a tight place, and have done all they could to invite the Wringer Combination to attack them and to defend their customers from annoyance. They announce that they have what they consider a perfectly good defense, and as they are abundantly responsible, we presume the Wringer Combination will contest the issue with them and not with dealers.

Reclaiming the Zuyder Zee.—According to recent reports it seems to have been definitely determined to reclaim the Zuyder Zee, Holland, whereby a large tract of land

would be rendered available for agricultural and other purposes. The engineers in charge of this work have been engaged for ten years past in preparing the plans, and the total cost is now estimated at not less than \$45,000,000. The dyke will be about 2 1/2 miles in length, and will extend from the city of Enkhuizen to the coast of the province of Overijssel. The top of the dyke will be built to the height of 16 feet above the level of the sea, which will bring it about 6 1/2 feet above the highest tide. The dyke will be formed from sand and faced with clay, and will be built of sufficient dimensions to resist the heaviest seas. It is intended to commence operations on the work at four different points, and the calculation is to have it completed in from seven to ten years.

Special Notices.

E. BISSELL & CO., AUCTIONEERS.

THURSDAY & FRIDAY, April 27th and 28th,

At 10 A. M.,
at
53 Chambers and 65 Reade Streets.

SPECIAL SALE OF Hardware, Cutlery, House- furnishing Goods, &c.

Comprising a general assortment of
SHELF HARDWARE, EDGE TOOLS, SHOVELS
AND SPADES, &c.
Also four cases first-quality Fish Lines. Also 500
Iris Stamped, Tinned and Enamelled Ware, direct
from the factory, comprising a full and desirable
assortment. Also a desirable line of Foreign and
American Pocket and Table Cutlery.

For Sale.

Two Traveling Cranes, 20-ton capacity. Also
two Lathes Patterns, 18 feet bed. A lot of
6 Chucks from 18 inch to 36 inch, new; all
New York Steam Engine Co.'s make. Also
Iron Hanger Patterns from 1 inch to 4 inch, com-
plete.

JOSEPH LUMLEY,
144 N. 3d St., Philadelphia, Pa.

For Sale.

Hardware Business, Stock and Fixtures for sale;
well established stand; doing good business.

HARDWARE,
1403 Ridge Avenue, Philadelphia, Pa.

For Sale.

A well-established, growing Hardware and Store
business at Hot Springs, Ark. Clean stock.

Address LOCK BOX 415,
Little Rock, Ark.

Export.

An American of middle age, with a long business
experience in foreign countries, is making up a
voyage to the East Indies, Australia, New Zealand
and Cape Colony, Africa, and will take a sample
line of American hardware, machinery and special-
ties, if a sufficient number of responsible houses
apply. Solid references given.

Address TRAVELER,
P. O. Box 453, New Haven, Conn.

MINING ENGINEER

AND
Superintendent Wanted.

A practically experienced and reliable person,
to take charge of Hematite Mines, worked in
levels and on surface. Address, giving full particu-
lars as to age and experience, and where formerly
operating.

STEEL CO. OF CANADA,
London, Nova Scotia.

Wanted.

By a Manufacturing and Importing House of Cut-
lery, a Salesman on commission for each South-
ern and Western Trade.

Address J. G. A.,
Office of The Iron Age, 320 R. 4th St., Phila., Pa.

Situation Wanted

By a man, aged 39, of several years' experience
in all the details of a Merchant-Bar and Sheet
Mill, as Assistant Manager, Stockholder, Time-
keeper or Shipper. Good references. Five years
in last situation. Apply to
C. F.
P. O. Box 453, New Haven, Conn.

Wanted.

Thoroughly competent Merchant Roller for 16
and 18-inch Trains. Apply to

TOOKE STRAKER, Manager,
Boonton Rolling Mills,
Boonton, N. J.

WANTED.

A position as Hammerman, by a
man experienced in all kinds of Locomotive,
Marine and General Forgings in Steel. Address
F. TINDLE,
4436 Lackawanna St.,
Frankford, Philadelphia, Pa.

Wanted.

A Partner with \$5000 to \$10,000 in a Foundry and
Machine Business, established in 1841. For particu-
lars, inquire of

I. H. COLLIER,
Poughkeepsie, N. Y.

Wanted.

All manufacturers to know that the HOLT
MANUFACTURING CO., of Cleveland, Ohio, will
on and after April 1, sell the celebrated HOLT
PORTABLE FORGES from \$40 upward. After
thirteen years' experience in the Forge business,
they think best to discontinue the agent system
and sell direct to consumer. Write for circular of
particulars and photographs of machines.
Address HOLT MANUFACTURING CO.,
Cleveland, Ohio.

DRILL PRESS FOR SALE.

Drill Press for sale—A new Upright Power
Drill Press, swings 20 inches, back geared, quick
return motion, steel spindle and shaft, superior
finish; weight, 1200 lbs.; price, \$210.
PERKINS PUNCH AND SHEAR CO.,
111 W. Liberty St., New York.

MAN OF TWENTY-SIX.

A man of twenty-six, fully competent, desires
a situation in the Hardware trade. Would
travel. Have had full charge of a large retail store,
and am a worker.

IRVIN BESSE,
Peabody, Mass.

Special Notices.

New Iron Working Machinery.

ENGINE LATHES.

One 24 in. swing (cap), 12 foot bed. (English make).
Swings in gear 42 x 15 in. wide. On hand.

Two 36 in. swing, triple geared (bed made to suit).
Fitchburg June delivery.

One 24 in. swing, 20 ft. bed. Fitchburg. April and
May delivery.

Two 36 in. swing, 24 ft. bed. Fitchburg. April delivery.

Two 36 in. swing, 24 ft. bed. Fitchburg. April and
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Special Notices.

TENTH CINCINNATI

Industrial Exposition,

1882.

Opens September 6,

Closes October 7,

In the Grandest Exposition Buildings in the

United States. Exhibitors from every State in

the Union.

The Great National Exhibition of

ART AND INDUSTRY.

No charges for space or steam power. Special

arrangements made for transportation of exhibits

and visitors. For full particulars address

W. H. STEWART,

Secretary.

FOR SALE OR TO RENT.

New, light factory; 70,000 floor feet; 875 H.

P. Cortis Engine, giving power at minimum

cost.

Shifting, piping, elevator, &c., all complete and

modern. Lowest insurance rates. Railroad sid-

ing and ample yard room. Immediate posses-

sion.

A large quantity of General and Special

Machinery at low prices.

SHARPE RIFLE COMPANY,

Bridgeport, Conn.

For Sale.

A Hardware Manufactory, at Westville, Conn.,

consisting of Foundry, Machine Shop, Storehouse

and other buildings; also Water Power, Engine,

Boiler, Patterns, Tools and Machinery used in the

same. Address

THE BLAKE HARDWARE CO.,

New Haven, Conn.

For Sale.

Horizontal Engines, 18 x 30 inch, slide valve;

also 16 x 24 (Hewes & Phillips), with cut-off;

25 x 36 (Currier), with cut-off; 16 x 28 Upright En-

gine, with cut-off; one 8 H. P. Locomotive Boiler;

one 4-ton "Otis" Freight Elevator; No. 5 Knowles

Steam Pump. All the above guaranteed com-

plete and in perfect order. For particulars ad-

dress

BELCHER & BAGNALL,

40 Cortlandt St., N. Y.

For Sale.

Stock of hardware, stoves and implements, and

store furniture, in one of the best towns in Kansas.

Address

HARDWARE,

Box 366, Salina, Kansas.

LARGE ENGINE LATHES FOR SALE.

One Lathe, 18 ft. bed, 24 in. swing, screw cutting,

triple gear, compound rest, with cross-feed.

One Lathe, 30 ft. bed, 35 in. swing, back gear,

compound rest, cross and angular feed.

One Lathe, 18 ft. bed, 30 in. swing, back geared.

These Tools are in use, and can be seen at our

factory.

THE STILES & PARKER PRESS CO.,

Middletown, Conn.

Manufacturing Property for Sale.

The Real Estate of the late Foundry and Ma-

chine Company of Taunton, Mass. Buildings con-

sist of Foundry, Machine, Erecting and Black-

smith Shops, and covering about 60,000 square

feet of ground. For particulars apply to

THE GEORGE PLACE MACHINERY AGENCY,

121 Chambers St., New York.

For Sale.

One Upright 35 Horse-Power Engine, with fly-

wheel and driving pulley. Cylinder 10 inches

diameter, 30 inches stroke, Judson governor, and

Plunger Force Pump, 4 inches diameter, 8 inches

stroke, with brass plungers, brass flanged seats

and valves. One 10 inch, 30 in. swing, back geared

One Fly-Wheel, 7 feet in diameter, rim 8 inches

by 9 inches, with belt pulley 4 feet diameter, 10 1/2

In the face of this extraordinary development, present and prospective, it is evident that trade will have to be remarkably brisk to allow consumption to cope with such abundant supplies. London gave way £1 yesterday, cabling Chili Bars £64, and Best Selected, £70. To-day we receive a dispatch from there as under: "The market is unsettled and prices weak. Best Selected is quoted £70 and Chili Bars, £63." Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers, 30¢ @ 36¢; Circles, 33¢ @ 36¢; Sheathing, 28¢, and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-box ditto, 30¢.

Tin.—The week under review has been an eventful one, prices falling heavily. London declined from £106 to £96 in a single day, on the 14th inst., and between last night and this morning the price of Straits there fluctuated between £91 and £94, with an unsettled market, failures in the metal trade having taken place, and more of them being feared. When we come to consider that the price of Tin had been driven up to £114 simply by speculation, and for which there has at no time been any valid cause, we need not be astonished at lower prices, and, indeed, have to be prepared to see them still lower. Our market is more or less nominal. No spot sales have taken place, although it is said that 100 tons about have been sold at 22½¢, which price could not be procured again. With the London market at £94, or a parity of 21½¢ here, the markets at Singapore, Penang and in Australia are at a standstill, and with no demand for either Europe, America or China. As stocks are now rapidly accumulating at the places of production, a considerable drop there seems inevitable. Shipments first half of April from the Straits to the United States have been 100 tons, and to England none. We quote, at the close, Straits and Australian, nominally, 23¢, against the average of 19½¢ the past four years. On April 15, 1881, according to Messrs. William I. Russell & Co., 12 Cliff street, New York, the price of Straits was 20½¢; April 15, 1880, 19½¢; April 15, 1879, 14½¢, and April 15, 1878, 14½¢, the visible supply at New York and Boston, April 15, 1882, being 3546 tons. Consumption from January 1 to April 15, 1882, 2675 tons. We receive ourselves from London, to-day, the ensuing cable message: "During the week the market has been greatly depressed, owing to the collapse of the bull movement, and prices have fallen heavily. Straits Ingot being quoted at £93 @ £93.15 to-day. It is not thought that this state of affairs will continue, however, and an early recovery is looked for." Tin Plates.—It has almost come to be regarded by the trade on this side as an invariable rule that any agreement among the Welsh makers to restrict their make promises a weak and declining market, and the present state of affairs only tends to confirm this opinion, since the life seems to have dropped out of the market. As, however, an agreement to curtail will lead to at least some reduction in the output, the market may still be benefited by the move later on. For the moment, no doubt, the decline in, and uncertainty about, the future of Pig Tin has something to do with the present dullness. The season is, however, too well advanced to admit of a long continuance of this unsatisfactory aspect, as dealers' stocks will soon require to be replenished, and the present would seem to be a favorable time to enter the market. We quote toward the close, ordinary brands, large lots, per box: Charcoal Bright, \$6 @ \$6.25; ditto Ternes, \$5.25 @ \$5.50; Coke Tin, \$5.12½ @ \$5.37½, and ditto Ternes, \$5.12½. Coke was cabled from Liverpool yesterday 15/6, and Charcoal, 18/6 @ 21/.

We receive from London to-day the following cablegram: "The market is quiet and prices steady, with probabilities of better figures. The makers have agreed to restrict production 15%."

Lead.—Since our last report there has changed hands between 200 and 300 tons at \$4.95 @ \$5 for Common Domestic, the closing quotation being 5¢. We quote Refined, which remains inactive, \$5.10 @ 5.12½, nominally. St. Louis announces a very quiet market; Hard at \$4.65 and Soft at \$4.70, with 38¢ freight. From London we receive per cable, to-day the ensuing: "The market is quiet, with fair demand and steady prices. English Pig, common, £14.10 @ £14.17/6." Manufacturers have been subject to no change since our last. We quote: Pipe, 7½¢; Sheet, 8¢; Tin-lined Pipe, 15¢, and Block, 45¢; all less 10¢ to the trade.

Spelter and Zinc.—The market for common Spelter has been quietest, though firm, at 5½¢ @ 5½¢ for Domestic, and 5½¢ @ 5½¢ for Silesian. This year's consumption in this country we estimate at 30,000 tons, if the demand remains steady, as it has been since January 1st; the domestic output we value at 18,000 tons, so far as we are able to judge at present; in order, therefore, to be able to carry into 1883 about the stock we had on January 1, 1882, we shall require, in all, 12,000 tons of foreign, of which we have received, so far, about 3500 tons. We quote Bertha Refined, 8¢, and Bergonport, 9½¢. Sheet Zinc is moderately active, at 7½¢ @ 8¢. We receive from London the following dispatch per cable: "There is a fair demand and prices are firm. We quote Ordinary, at shipping port, £17 @ £17.5/."

Antimony.—People are taken a little aback in consequence of the announcement of failures in the metal trade in London, otherwise the market remains tolerably steady, with a fair jobbing trade doing. We quote Cookson, 14½¢ @ 15¢, and Hallett, 12½¢ @ 13¢, according to quantities wanted.

COAL.

The Coal trade is dull and inactive, there being no perceptible change in this respect compared with one week ago. The only new feature affording satisfaction is the apparently happy turn of events in the Bituminous trade, the apprehended strike in the Clearfield districts having been averted. The miners were not sustained in their purpose by the chiefs of the trade organization, and continued as before. In anthracite, prices are weak and irregular, the concessions of the part of dealers, according to report, being about 50 cents per ton. There is no present that circular prices are obtained

On the other hand, it is claimed that since the suspension of mining in the Cumberland region, consumers of Bituminous are more inclined to substitute the harder varieties. For Eastern orders there is more doing than for some time past.

Of the Schuylkill trade the *Miners' Journal* says: "The country is evidently not suffering for stove-burning coal, and it is only sacrificing a valuable commodity to attempt to force it upon an unwilling market. Still it is an inconvenient thing to have on hand when once taken out of the ground and broken up for general use. The wisdom of restricting production is very apparent under the circumstances, and had there been more of it ordered for this month it would be all the better for the trade. There will have to be a marked improvement in the demand to prevent a still greater demoralization of the trade before the period usually assigned for the opening of the spring trade, and the least evidence of an improving tendency is certainly not discernible to-day."

In the Bituminous trade prices are spoken of as drooping, and without profit.

The total tonnage of Anthracite Coal from all the regions, for the week ending April 8, as reported by the several carrying companies, amounted to 400,077 tons, against 401,562 tons in the corresponding week last year. The quantity of Bituminous Coal sent to market for the week amounted to 71,432 tons, against 106,161 tons in corresponding week last year.

Freights to Boston, \$1.25 @ \$1.40 from Philadelphia; and from Baltimore, \$1.50.

At a recent meeting of the miners and shippers of Coal for the Western market, held in this city, it was

Resolved, That the prices for Buffalo and Lake ports be reduced from present prices, as follows: Grate, 30¢; Egg, 55¢; Stove, 65¢; Chestnut, 65¢; and that at all interior points the same reduction be made, excepting that at all points the Grate and Egg shall be 25¢ less than Stove and Chestnut—prices to take effect on the 17th and extend to June 1, 1882.

Resolved, That the price of Pea Coal be \$1 less than the price of Chestnut, and that the size of Coal known as No. 4 be 25¢ per ton above Stove, making the prices in gross tons as follows, viz:

F. O. B., Grate and Egg..... \$4.00
F. O. B., Stove and Chestnut..... 5.15
Salamanca and Bridges, on cars, Grate and Egg..... 4.60
Salamanca and Bridges, on cars, Stove and Chestnut..... 4.85
Salamanca and Bridges, on cars, No. 4..... 5.10

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy.....	10¢ @ 10.15¢
light.....	9¢ @ 9.15¢
Copper Bottoms.....	14¢
Yellow Metal.....	10¢ @ 10.15¢
Brass, heavy.....	10¢ @ 10.15¢
light.....	9¢ @ 9.15¢
Composition, heavy.....	10¢ @ 10.15¢
light.....	9¢ @ 9.15¢
Lead, heavy.....	10¢ @ 10.15¢
light.....	9¢ @ 9.15¢
Tea Lead.....	10¢ @ 10.15¢
Zinc.....	10¢ @ 10.15¢
Pewter, No. 1.....	10¢ @ 10.15¢
Pewter, No. 2.....	10¢ @ 10.15¢
Wrought Iron.....	10¢ @ 10.15¢
Light do.....	10¢ @ 10.15¢
Stove Plate.....	10¢ @ 10.15¢
Machinery do.....	10¢ @ 10.15¢
Grate Bars.....	10¢ @ 10.15¢
Electrotype plates.....	10¢ @ 10.15¢
Stereotype plates.....	10¢ @ 10.15¢
Small type.....	10¢ @ 10.15¢

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Garvas, Linen.....	10¢ @ 10.15¢
White Cotton, New.....	10¢ @ 10.15¢
White, No. 1.....	10¢ @ 10.15¢
No. 2.....	10¢ @ 10.15¢
Seconds.....	10¢ @ 10.15¢
Mixed Rags.....	10¢ @ 10.15¢
Gunny Bagging.....	10¢ @ 10.15¢
Jute Butts.....	10¢ @ 10.15¢
Kentucky Bagging.....	10¢ @ 10.15¢
Book Stock.....	10¢ @ 10.15¢
Newspapers.....	10¢ @ 10.15¢
Waste Paper and Scraps.....	10¢ @ 10.15¢
Kentucky Bale Rope.....	10¢ @ 10.15¢

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements for the past week:

Imports.

For the week ending April 14:

Total.....	\$12,373,708	\$6,555,231	\$12,002,416
Prev. reported.....	\$12,108,481	\$6,555,231	\$12,002,416
Since Jan. 1.....	\$146,388,189	\$121,634,940	\$149,378,282

Included in the imports were articles of merchandise valued as follows:

Anvils.....	250	2,400
Brass goods.....	38	4,076
Bronzes.....	14	2,041
Chains and Anchors.....	72	3,885
Clocks.....	41	5,824
Copper.....	970	970
Cutlery.....	122	35,343
Cash fixtures.....	1	23
Gun.....	122	97,462
Hardware.....	10	400
Iron, pig, tons.....	8,265	149,050
Iron, sheet, tons.....	171	7,079
Iron ore, tons.....	4,112	97,462
Iron, other, tons.....	1,298	4,112
Iron, R. R. bars.....	3,174	30,298
Lead, pigs.....	3,065	13,751
Machinery.....	168	16,615
Metal goods.....	917	27,726
Nails.....	2	4,149
Needles.....	2	898
Nickel.....	7,834	7,834
Old metal.....	5	415
Platina.....	2	807
Plated ware.....	4	20
Quartz.....	375	10,948
Quicksilver.....	25	2,024
Reg. antimony.....	12	2,230
Saddlery.....	101,020	5,600
Steel.....	53,819	134,410
Spelter, lbs.....	5	47,812
Silverware.....	1	11,347
Tin, boxes.....	205	2,508
Tin, 1,000 lbs.....	1	9,125
Wire.....	1	1,000
Zinc, lbs.....	1	1,000

The following affords a comparison with previous dates:

For the week.....	1882.	1881.
Cutlery, pkgs.....	222	2,283
Hardware, pkgs.....	10	393
Iron, R. R. bars.....	3,174	44,828
Lead, pigs.....	3,065	4,709
Steel, pkgs.....	53,819	87,512
Tin, boxes.....	47,812	42,010
Tin, 1,000 lbs.....	45,266	3,116,084
Wire.....	1	4,878,744

Exports of specie.

For the week ended April 15:

Total.....	\$503,000
Previously reported.....	\$13,987,253
Total since January 1, 1882.....	\$14,490,253
Same time in 1881.....	\$13,739,888
Same time in 1880.....	\$13,068,897
Same time in 1879.....	\$13,389,048
Same time in 1878.....	\$13,002,021
Same time in 1877.....	\$13,395,804
Same time in 1876.....	\$13,229,852
Same time in 1875.....	\$13,857,862
Same time in 1874.....	\$13,952,898
Same time in 1873.....	\$13,004,510
Same time in 1872.....	\$13,509,670

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended April 18:

Total.....	\$7,555,888	\$6,550,451	\$6,205,130
Prev. reported.....	\$7,631,866	\$6,550,451	\$6,205,130
Since Jan. 1.....	\$100,187,454	\$113,666,375	\$92,184,137

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending April 19, 1882:

Hardware.....	1880.	1881.	1882.
Total.....	\$7,555,888	\$6,550,451	\$6,205,130
Prev. reported.....	\$7,631,866	\$6,550,451	\$6,205,130
Since Jan. 1.....	\$100,187,454	\$113,666,375	\$92,184,137

Imports.

For the week ended April 15:

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Sheet Iron.—In this department there is continued activity, and prospects are considered entirely satisfactory. On large orders there has been some cutting in prices, but for small lots the following are fair average quotations, viz.:

Common Sheet, No. 27 and 28.....	35¢
Common Sheet, No. 25.....	36¢
Common Sheet, No. 22 to 25.....	37¢
Common Sheet, No. 16 to 21.....	38¢
Best Refined 1/4" @ 1/4" advance on the above.....	39¢
Best Bloom Sheet, No. 25 to 28.....	38¢
Best Bloom Sheet, No. 22 to 25.....	39¢
Common Red Plates, 3-16 to 16.....	38¢
Rine Annealed, 3-16 to 16.....	39¢
Best Bloom Galvanized, discount.....	38¢
Second quality, discount.....	37¢

Wrought Iron Pipe.—Prices are weak and irregular at 40¢ discount for Boiler Tubes, and 60¢ for Gas and Steam Pipe.

Steel Rails.—The downward tendency, so frequently mentioned of late, has at last culminated in a decided modification of quotations. An order for 20,000 tons has been placed at a very low figure (understood to be \$50 at mill) and small lots are now available at \$53 @ \$55. A somewhat larger business is looked for now that values have been fixed, and a good many orders are likely to come on the market, say at prices ranging from \$52 @ \$53, and probably \$50 for such lots as above referred to. A difference of \$2 or \$3 in price can easily be made, according to quantity, time of delivery and terms of payment.

Steel Blooms.—There is some inquiry, but in the present condition of the Steel Rail trade it is scarcely likely that any business can be done. Sellers ask \$42, duty paid, for prompt shipments.

Iron Rails.—No large sales are reported, but there is a fair demand for small lots at prices varying from \$47 to \$51, according to weight and pattern of Rail.

Old Rails.—No business whatever in spot lots, although \$28 @ \$28.50 would probably be accepted if the offer was made. Double Heads are offered at \$29, Baltimore delivery.

Spikes.—Are in fair demand at about 3¢; Fish Plates, 2.5¢.

Crop Ends.—There is some inquiry, and business pending on the basis of about \$25.50 for prompt shipments.

Scrap Iron.—The market is quiet, and prices somewhat easier than they were a week ago. No. 1 Wrought varies from \$29 @ \$32, according to selection, Cast, \$20 @ \$21.

Nails.—Prices are very irregular, but \$3.30, net, appears to be the usual quotation. Stocks are light, and under ordinary circumstances better prices might be looked for at this season, but competition is unusually close.

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., April 18, 1882.

The situation as regards the general Iron trade is not as satisfactory as it was generally expected it would be at this time, unforeseen events having transpired which have disappointed the hopes of the more sanguine, but the outlook is still favorable for at least an average business. The crop reports are generally favorable; here and there the wheat crop has been damaged by the recent cold snap, but with this exception the outlook is encouraging for a bountiful harvest. Moreover, the high price for all kinds of grain will no doubt cause an increased acreage to be planted this year of spring wheat, corn and oats, and with good crop, all kinds of business will be stimulated.

The action of the Amalgamated Iron Association, at its meeting on Saturday last, to demand an advance of about 15 per cent. in the scale of wages for the next year, was generally unexpected, coming as it does with a general lull in the iron business. However, it is simply a proposition which the committee on the part of the Amalgamated Association is authorized to suggest and advocate at the conference with the mill owners. It is very certain that the mill owners will oppose the advance, and it is possible that the Amalgamated Association, after making a more thorough investigation into the present condition of the iron trade, will consent to a renewal of existing rates, which mill owners claim is all that they are able to pay. It is sincerely to be hoped that the matter will be amicably adjusted, and that there is good reason to believe that it will be.

Pig Iron.—There has been a moderate business during the past week—all that can reasonably be expected under existing circumstances. Sales of some 2500 tons Native Ore Forge Iron at \$24.75 @ \$25.4 mos., mostly at \$25. A small lot of Open Forge brought \$25.50. Foundry grades ranging from \$26.50 @ \$28 for Nos. 2 and 1. Bessemer Iron is nominal at \$28 @ \$29. Sales of Cold-blast Charcoal at \$38, cash. In view of what has already been stated, a lull in the demand for Finished Iron and the unsettled condition of the labor question, business is all that can be expected, although the sales are mostly small, indicating that consumers are buying only to supply immediate actual wants, and the probability is that this policy will be closely adhered to until the labor scale for the next year has been settled. Some few of the mills have sufficient raw material to last them until the 1st of June, but the majority will be required to buy more or less, both this month and next, in order to keep up mixtures, and a fair business is looked for in consequence.

Muck Bar.—Continues very dull—more so than Pig Iron—and prices are weak and irregular. It is rumored that offers have been made to sell as low as \$39, delivered in Pittsburgh, but the best makes are held at \$42. There is a great difference in the quality of Muck, just as in the case of Pig Iron, and this accounts for the wide range in prices—\$39 @ \$42.

Manufactured Iron.—The comparative dullness noted for some time past continues, and some few of the mills have changed from double to single turn. There is no question but what a good deal of the spring business was anticipated during the winter, which was an unusually open one. The demand for all kinds of railroad supplies has fallen off materially, and then the enhanced cost of labor and building material has caused the abandonment, for the present, of a great many contemplated improvements.

This being the case, it is not strange that there is a lull in the Finished Iron market, and a weakening in price is to be expected in consequence. It is known that slight concessions have been offering for some weeks past by mills west of Pittsburgh, and the fact that prices have weakened has had its effect in curtailing the demand, as it causes both jobbers and consumers to hold off, in anticipation that prices may go still lower.

Nails.—There has been a decided improvement in the demand during the past week, and the factories, both here and at Wheeling, have about all they can do. Stocks in first hands are much less than at corresponding time last year, and the outlook is very promising for a good spring and summer trade. While we continue to quote card rates, they are not in all cases being realized. It is rumored that Wheeling makers have been "cutting," more or less, for some weeks, and our manufacturers have been obliged to do likewise. The improved demand, however, to which reference has been made, will no doubt stiffen up the market, and it is doubtful whether an order for a large lot could now be placed under card rates.

Wrought Iron Pipe.—There is a fair and increasing business, and the indications are that all the pipe mills will be fully employed within the next few weeks. Prices unchanged; discounts on Gas and Steam Pipe, 60 @ 62 1/2%; on Boiler Tubes, 42 1/2 @ 45%. Oil-well Casing is quoted at 65 @ 67 1/2¢ per foot, net, and ditto Tubing at 13 @ 20¢.

Rails, &c.—The market here for Steel Rails, as elsewhere, continues dull, and in the absence of sales we omit quotations; our mills, however, are well supplied with orders, and are working up to their full capacity. Track supplies are comparatively quiet, but prices remain unchanged. Railway Spikes, 3.15¢ per keg, 30 days; Splice Bars, 2.50¢ @ 2.60¢; Track Bolts, 3.75¢ @ 4.10¢.

Steel.—There is a continued fair business; not so many new orders offering, but the mills generally appear to be fully employed. Prices unchanged.

Scrap.—The market for all kinds of Scrap continues dull, and prices are weaker, but without quotable change. Wrought Scrap is still quoted at \$30 per ton for Ordinary, and \$31 @ \$32 for Selected Railway; sales of Wrought Turnings at \$22 per gross ton, 4 mos., and Cast Borings at \$16, gross, 4 mos.; Old Car Springs and Axles are still quoted at \$38 @ \$40, per net ton; Old Car Wheels continue very dull, quoted nominally at \$28 @ \$29 per gross ton for straight lots, and \$26 @ \$27 for mixed. The consumption of Car Wheels here has fallen off largely as compared with what it was some years ago, which may be accounted for by the fact that Bessemer Iron has taken their place.

Window Glass.—The active season has not set in yet, but the indications are favorable for a good summer trade, and manufacturers are busily engaged in working up an assorted stock with which to meet the demand when it opens up. No change in card or discounts.

Coke.—This important and growing interest continues active; shipments out of the producing region estimated at from 60,000 to 70,000 tons per week. Makers are better prepared now to meet the demands made upon them at any time this year, owing to the fact that they are able to obtain transportation; for want of cars business was very much restricted during the greater part of the winter. Prices remain unchanged at \$1.75 @ \$2 per ton, delivered free on cars at ovens.

CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, Chicago, April 17, 1882.

The favorable weather of the past week has had a stimulating effect on general trade, and outdoor work is being prosecuted with renewed vigor. The demand for Builders' Hardware is active, and the number of new buildings under contract unusually large.

Messrs. Carmichael & Emmens have opened an establishment at Nos. 21, 23, 25 and 27 West Lake Street, under the management of Mr. C. W. Davenport, formerly of Van Winkle & Davenport, of San Francisco, and will keep in stock a full line of Boiler Plates, Tubes, Bolts, Rivets, Iron and Steel, &c.

Nails.—We have no change to note in the Nail market. The demand is good. We quote \$3.40 @ \$3.50 for rod, to 60d.

Pig Iron.—While the hand-to-mouth character of orders still continues to be the rule, the amount of business done during the week has been very satisfactory. Furnacemen say that the present practice of placing orders for actual needs only will not continue long, as, if nothing occurs to mar what has at present every appearance of becoming a good harvest, Pig Iron will certainly become stiffer in price. We quote: Lake Superior Charcoal, Nos. 1 and 2, \$31 @ \$32; No. 3, \$33; Nos. 4, 5 and 6, \$34 @ \$36; Calumet, \$28 @ \$29; Silvery Soft, \$26 @ \$27; Crane, No. 1, \$29; No. 2, \$28.50; Thomas, \$28.50 @ \$30; Imported Scotch, \$30 @ \$31, and American Scotch, \$27 @ \$30.

Manufactured Iron.—The market during the week has improved somewhat and orders are coming in more freely. We quote: Bar, 2.90¢ @ 3¢; Angle, 4¢; T, 4 1/4¢; Beams and Channels, 4 1/4¢ @ 4 1/2¢; Hoop at 3.80¢ rates. Sheet, Plate and Tank, 10 to 14 gauge, 3.80¢; 15 to 17 ditto, 4.10¢; 18 to 21 ditto, 4.40¢; 22 to 24 ditto, 4.60¢; 25 to 26 ditto, 4.80¢, and 27 ditto, 5¢. Patent Cold-rolled Shifting, dis. 20¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 6¢ rates; Ulster Iron, 4 1/2¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7 1/2¢ off list; Wrought Boat Spikes, 3 1/4¢ rates.

Steel.—We have nothing special to note in Tool, Machinery and Agricultural Steels. The market at present has a quiet tendency. We quote: Tool, 12¢; Machinery, O. H., 5 1/2¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 7¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. Sheet, first, second and third quality, 12¢, 10 1/2¢ and 8 1/2¢, respectively; Crucible Flow, 6 1/4¢;

Eagle Plow, 5 1/2¢; Iron Center Plow, 10 1/4¢, and soft Steel Center Plow, 10 1/4¢.

Scrap Iron.—Quotations are lower and demand for all kinds exceedingly dull. We quote (dealers' purchasing prices): No. 1 Wrought Scrap, \$23, net ton; No. 1 Railroad Scrap, \$24 @ \$25; ditto Heavy Cast, \$18; ditto Stove Plate, \$12; ditto Cast-iron Borings, \$9 @ \$10, and ditto Machine Shop Turnings, \$12 @ \$13.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., Chattanooga, April 17, 1882.

Spring trade seems to begin in a fitful, drizzling sort of way. There has been so much spring weather too early in the season, and so much apprehension of April and May winters, that business men have hesitated about fully entering upon real spring business. The same considerations have materially retarded building operations. The weather the past week has been cool, without frost or rain.

Pig Iron.—The lower grades of Pig are more plentiful than for some time. Rosales have practically slightly increased stocks. The larger output of foundry grades has stopped complaint as to scarcity, and the supply is now equal to the wants of the trade. Prices are not very strong, but there is not enough cutting to justify a change of quotations. We quote: No. 1 Foundry, \$24 @ \$25; No. 2 Foundry, \$22 @ \$23; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Car-wheel Metal, \$33 @ \$37.

Ores.—We have nothing of interest to report of the Ore market. We quote: 50% Brown Hematite, 1/2 ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are steady at \$29; Wrought Scraps, \$20 @ \$23; Cast Scrap, \$13 @ \$15; Old Wheels, \$28 @ \$29.

Nails.—Dealers in this district are a little curious to know why the Western Nail Association confirmed the \$3.40 card, when several mills belonging to that association were offering Nails, laid down at various inland Southern points, at \$3.30. We quote at \$3.30 rates, job lots, and usual discounts on large bills.

Manufactured Iron.—Bar is steady at \$2.50 for large bills. The mills have all they can do to meet orders. Track fillings are steady. We quote: Railroad Spikes, \$3.40; Track Bolts, \$4; Fish Plate, \$3.

Coal.—We quote Fancy Lump, \$3.50; Common, \$2.50; Run of Mine, at mills, \$2.

Coke.—There has been no change for some months in the Coke market; but movements looking to material increase of the supply indicate a reduction at an early date. We quote: Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—Steel is fairly quotable at about \$53 as an outside figure. Iron Bars, nominal, at \$48, Heavy Sections; Small T, \$53 @ \$55.

CINCINNATI.

APRIL 17.—**Pig Iron.**—The market in the past week has been very quiet, little or nothing done, further than filling orders for car lots. There seems to be a certainty that all consumers will be compelled to enter the market speedily for round lots, and it is generally known that willing sellers will be found to cover requirements, and at some concession in prices, but only on Forge and the lower grades of Foundry. The late severe frosts have destroyed the fruit crops throughout Kentucky, Southern and Middle Ohio, Indiana, Illinois and Missouri, and the wheat and barley to an extent that is alarming, and they have brought manufacturers of every class to reconsider their enterprises for the future; they will hold their affairs in abeyance till further developments as to the actual extent of the disaster. Some of the railroad companies are already canceling their orders for cars and wheels, or seeking further delay of deliveries of material to them. The present estimates of the damage to the growing crops must be taken, with some allowances, until the farmers recover from their panic and the facts are better known, which will be a fortnight later. The following quotations represent the sales in the past week: Best Hanging Rock Charcoal Foundry, \$29.50; good, \$29; No. 2, \$28. Best Tennessee and Alabama, Foundry, \$28; good, \$27. Best Southern Coke Foundry, \$27; good, \$26. Southern Coke Forge, \$22.50 @ \$24; Hanging Rock Coke Forge, \$24 @ \$25; Hanging Rock Charcoal Forge, \$25.50 @ \$26.50; American Scotch Hanging Rock and Hocking Valley, \$25.50 @ 26.50; Silver Gray Softeners, Hanging Rock and Hocking Valley, \$22.50 @ \$25. Scrap Iron, Wrought.—Rails, \$28 @ \$29; No. 1 Country, \$1.30 @ \$1.40; good, \$1.10 @ \$1.30. Cast.—Old Wheels, \$28 @ \$29; No. 1 Machinery, \$1 @ \$1.10; good, 80¢ @ \$1; light, 50¢ @ 70¢. Bar Iron.—\$2.60 card rate; concession made on round lots of smaller sizes. Mills all in operation on satisfactory orders. Nails.—Mills all running, some on double turn, on booked orders. Card rate, \$3.50; discount to dealers in round lots.

LOUISVILLE.

Messrs. Geo. H. Hull & Co., Commission Merchants, report to us as follows, under date of April 15, 1882: There is considerable inquiry for Iron, and some sales have been made, but at prices that show considerable reduction from prices asked last week. We have, accordingly, marked down quotations to agree with sales made. The following figures are for cash:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal.....	\$7.00 @ 26.00
No. 1 Southern, Charcoal.....	25.00 @ 26.00
No. 1 Hanging Rock, Stonecoal and Coke.....	25.00 @ 26.00
No. 1 Southern, Stonecoal and Coke.....	24.00 @ 25.00
No. 1 American Scotch.....	22.00 @ 23.00
Open Silver Gray.....	13.00 @ 14.00
Cold Silver Gray.....	11.00 @ 12.00
MILL IRONS.	
No. 1 Charcoal.....	24.00 @ 24.50
No. 1 Stonecoal and Coke, Neutral.....	22.00 @ 23.00
No. 1 Stonecoal and Coke, Neutral.....	21.50 @ 22.00
No. 1 Stonecoal and Coke, Cold-short.....	22.00 @ 23.00
No. 1 Stonecoal and Coke, Cold-short.....	21.00 @ 22.00
White and Mottled, Cold-short and Neutral.....	19.00 @ 20.00

CAR WHEEL IRONS.

Hanging Rock, Cold-blast.....	35.00 @ 37.00
Hanging Rock, W. B.....	30.00 @ 31.00
Alabama and Georgia, Warm and Cold-blast.....	30.00 @ 36.00
Central Kentucky, Cold-blast.....	33.00 @ 35.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of April 15, 1882: The market is without animation, and while inquiries are reported better for the past few days, yet there is little new business offering. Old contracts are being cleaned up gradually. There is, in some cases, difficulty even in getting prompt specifications for these. Nails are going in fair lots, at a slight cut from card rates. Stocks in this city are much reduced; indeed, jobbers are unloading in many lines, as there is good prospect of dullness for 60 days to come. All depends on the crops. Another crop failure in the South would be most disastrous, whereas a good yield would permit the planters to pay out. The freeze hereabouts, this week, after several days of summer temperature, destroyed much fruit, which, being a cash crop, is a bad beginning.

ST. LOUIS.

Messrs. HOFFER, PLUMB & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, write us, under date of April 15, 1882: The market is still dull and lifeless, and prices continue nominally as follows:

HOT BLAST CHARCOAL.	
Missouri.....	\$26.00 @ 27.00
Ohio.....	28.00 @ 29.00
Southern.....	26.00 @ 27.00
COAL AND COKE.	
Missouri.....	None offering
Southern.....	26.00 @ 26.50
Ohio.....	26.00 @ 27.00
MILL IRONS.	
Red-short.....	26.00 @ 27.00
Neutral.....	24.00 @ 25.00
CAR WHEEL AND MALLEABLE IRONS.	
Missouri.....	28.00 @ 29.00
Southern.....	28.00 @ 29.00
Ohio.....	26.00 @ 28.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of April 17, 1882: There is little or no change to note in this market for the past week; trade remains quiet, with shrinking values and accumulating stocks.

Ref. Bar Iron, 1 to 6 x 1/4 to 1 1/2 x 3/4 @ 2 1/2 to 2 3/4	
" 1 to 4 1/2 x 1 1/2 to 1 1/2 x 3/4 @ 2 1/2 to 2 3/4	
" 1 to 4 1/2 x 1 1/2 to 1 1/2 x 3/4 @ 2 1/2 to 2 3/4	
Hoop and Square.....	
Hoop Iron, 1 1/2 wide and upward.....	3 1/4 @ 3 3/4
Band Iron, from 1 1/2 to 4 in. wide.....	3 @ 3 1/4
Horse-shoe Iron.....	3 1/4 @ 4
Barley Nail Rods.....	3 1/4 @ 6
Black Diamond Cast Steel.....	12 1/2 @ 14 1/2
Machinery Steel.....	9 @ 9 1/2
Cast Spring Steel.....	8 @ 8 1/2
Common Horse Nail.....	25 @ 26
Railroad spikes, 5 1/2 x 9 x 5.....	3 1/2 @ 3 3/4
Perkins' Horse shoes, keg of 100 lbs.....	\$4.87 1/2
" Mule shoes.....	5.87 1/2

RICHMOND.

Mr. ASA SYNDER, Iron Merchant and Furnace Agent, writes as follows under date of April 17, 1882: A quiet market may be quoted for the past week; special brands, however, are in good demand. Producers and consumers are watching the market closely, and opinions vary widely. We continue to quote prices as follows:

No. 1 Scotch Pig Iron.....	26.00 @ 29.50
No. 1 Anthracite Pig Iron.....	27.00 @ 29.00
No. 2 ".....	24.00 @ 25.50
No. 2 ".....	23.00 @ 25.00
No. 1 Virginia Coke Pig Iron.....	25.00 @ 26.00
No. 2 ".....	22.50 @ 23.50
No. 3 ".....	20.00 @ 23.00
Virginia Charcoal C. B. Wheel Iron.....	34.00 @ 36.00
Old Rails.....	26.00 @ 28.00
Wrought Scrap, No. 1.....	26.00 @ 28.00
Cast, Machinery Scrap.....	20.00 @ 21.00
Refined Bar Iron.....	3¢ @ 3 1/2¢
Horse Shoes (Tredegar).....	4.00
Mule.....	5.00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., April 3, 1882.

WEE WEEK has been quiet and entirely free from features of notable interest in the iron trade. Scotch pig iron has been without any change of importance, and rules quiet all round, both as regards warrants and makers' iron. The shipments continue large, and money is very easy, but speculators do not seem to have any confidence in the prospects of an early rise; hence Glasgow is lifeless. Were the reports from the United States more favorable, we should certainly witness greater firmness, but, so long as our mail and cable advices are as at present, it is clear that we need not expect to send you much iron on new orders. The feeling at Middlesbrough resembles that at Glasgow, and there is no appreciable change to note in prices, which are based on 43/ for No. 3. The hematite iron trade of the West Coast is similarly depressed, with 56/ or thereabouts, the ruling quotation for mixed lots of Nos. 1, 2 and 3. Elsewhere, both crude and finished irons are without feature, all recent prices being nominally maintained at about late rates, but with a great deal of underselling and cutting for the few orders now in the market.

SCOTCH PIG IRON

has been dull, and is now quite unstable on the basis of about 47/11 for warrants and makers' brands, as given below. There are 107 furnaces in blast in Scotland (including nine on hematite) against 121 this date last year. To date this year the total shipments have been 135,170 tons, an increase of 24,282 tons. Last week they were 12,375 tons—a comparative increase of 115 tons. In Connal's stores there are 629,819 tons, as against 538,981 tons this date in 1881. Last week there was a decrease of 55 tons. The imports from Middlesbrough into Scotland this year to date have been 72,456 tons—a total increase of 4670 tons only. Last week there was a decrease of 2550 tons. Writing from Glasgow, March 31, James Watson & Co. said: "The market for Scotch pig iron has

been irregular this week, but lifeless, with not much fresh business doing, the transactions being mainly the operations of members of the trade. On Monday the warrant market opened flat, with business from 47/11 to 47 7/8, cash, rallying afterward to 48/3, cash. On Tuesday the price improved from 48/ to 48 5/8, closing at 48 3/8 per ton. On Wednesday the market was firm, with transactions from 48 5/8 to 48/8, and yesterday, after opening firm at 48/6 to 48 7/8, cash, the market declined to 48/1 per ton. To-day the market has been quiet from 48/1 to 48 1/4, again receding to 47/10 1/2, at which it closes sellers. The shipments last week were 12,375 tons, as compared with 12,262 tons for the corresponding week of last year." We quote:

G. M. R., at Glasgow.....		No. 1.	No. 2.
Clyde.....	47/	50 9	47/
Coltness.....	48/	50 6	52/
Langloan.....	48/	50 9	53/6
Gartsherrie.....	48/	51 3	49/6
Summerlee.....	48/	51 3	51/
Caldar.....	48/	52 6	49/
Carbroe.....	48/	52 6	48/6
Glenarnock, at Ardrossan.....	48/	49/	47/
Edinburgh.....	48/	49/	47/6
Dumfries.....	48/	50 6	47/6
Shotts, at Leith.....	48/	49/	47/
Kinnell, at Bo'ness.....	48/	49/	47/
Carron, at Grangemouth.....	48/	49/	47/6

The quotations of John E. Swan & Bros., Limited, agree with these.

CLEVELAND PIG IRON

is steady, but has been devoid of exceptional movements since I last wrote. The shipments and local consumption are very good, and the prospects of the district are regarded without apprehension. Current prices of G. M. B., f. o. b. at makers' wharves in the Tees, are:

No. 1 Foundry.....	47/	Mottled.....	42/
" 2 ".....	45/6	White.....	41/6
" 3 ".....	43/6	Refined Metal.....	..
" 4 ".....	43/	Kentledge.....	43/6

The steel works are busy. From Erinus, crop ends are being sent to the United States; and, from Bolckow-Vanhan's Easton Works, steel rails are being shipped to your ports, as well as to Bombay and other Indian ports. The foundries and engineering works are fairly employed—some busy.

WEST COAST HEMATITES

are featureless at the very low rates mentioned in these letters several times lately, as well as in your cable dispatches. In some quarters it is anticipated that the bottom has been reached, but buyers are holding back in the expectation of still lower prices, which seem improbable at the present values of ores, &c. I call average lots of Nos. 1, 2 and 3, 56/ @ 57/6, and makers' brands:

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Bars of iron.....	1,470
Ingot of iron.....	6,023
To Philadelphia—Crop ends, tons.....	1,000
To New Orleans—Rails, tons.....	1,130
To Galveston—Rails, tons.....	435
To San Francisco—Rails, tons.....	500
The totals thus are:	
Rails, tons.....	3,065
Tin plates, boxes.....	27,516
Wire, bundles.....	4,825
Spiegel, tons.....	1,404
Blooms, tons.....	4,004
Crop ends, tons.....	1,339
Pig iron, tons.....	2,517
Scrap iron, tons.....	283

THE LEADING AGRICULTURAL SHOWS

of the forthcoming season have now had their dates and localities fixed. I select a few of the principal fixtures for the information of such of your implement, pump, &c., manufacturers as may desire to exhibit thereat:

Society or show.	Place of show.	Date.	Entries close.
Bath and West of England.....	Cardiff	May 29 to April 19.	
Royal Counties of England.....	June 27, &c.	May 15.	
North-east of Ireland.....	Belfast	June 22, &c.	May 13.
Royal of London.....	Reading	July 10, &c.	July 1.
Highland.....	Glasgow	July 27, &c.	June 1.
Lincolnshire.....	Lincoln	July 19, &c.	June 12.
Yorkshire.....	Halifax	Aug. 1, &c.	June 21.
Royal Manchester and Liverpool.....	Preston	Sept. 5, &c.	Aug. 1.
Birmingham.....	Birmingham	Nov. 25, &c.	Oct. 19.
Southfield.....	London	Dec. 4, &c.	Oct. 2.

The Royal Society of Ireland will have no show this year.

THE TIN PLATE TRADE

would now seem to be in a fair way of redressing its grievances, or, at all events, of "working out its own salvation" to use a sanctimonious phrase in relation to an extremely prosaic matter. I have already quoted several opinions bearing upon the industry, to which I may add that a very large meeting of manufacturers was held at Swansea on Thursday. The chairman of the Tin Plate Manufacturers' Association (Mr. P. W. Flower, of Neath) presided, and among the 51 works represented were many leading makers, including Mr. James Spence and others who have long advocated the proper and efficient regulation of the make. After some discussion, resolutions were carried declaring it necessary to effect a restriction of the present rate of production, and appointing a council, or committee, to regulate the supply in accordance with the demand. As a means of maintaining and carrying out these resolutions an agreement was signed by the majority of those present (owning 144 mills) and has since been sent to those not present for their signatures. The chief clause of this agreement enforces a stoppage of all the mills one week out of every four during April, May and June, leaving the council to decide what restriction, if any, may be necessary thereafter. A penalty is to be imposed upon those makers who violate the letter, or the spirit, of the agreement, and, I am told, will be enforced by a common deposit in advance. This is about all the information that has been permitted to transpire in respect of the gathering, which has had better results than had been anticipated. Whether those not present will fall in with the arrangement remains to be seen. Progress will be reported, in all probability, at the quarterly meeting of the trade to be held at Birmingham on Wednesday, April 12. It is believed that the reduced make will be carried out, in which case prices may be considered to have reached the minimum—indeed, a recovery is already in progress. Common I. C. cokes have improved to 16/ or 16 1/2 per box, and more strongly held by both makers and merchants.

SOME CURRENT PRICES,

as appended, are taken from the circular of a large firm here:

	Price.	Disc't.
Copper sheets, 24, per ton.....	75 0 0	2 1/2
Copper sheathing, per ton.....	77 0 0	2 1/2
Yellow metal sheets, 24, per lb.....	0 0 5 1/2	2 1/2
Yellow sheathing, per lb.....	0 0 6 1/2	2 1/2
Wallaroo copper, per ton.....	72 0 0	2 1/2
Chili copper, per ton.....	74 0 0	2 1/2
Best selected zinc, per ton.....	71 0 0	2 1/2
Brass wire, per lb.....	0 0 7	2 1/2
Copper wire, per lb.....	0 0 9	2 1/2
Composition nails, per lb.....	0 0 7 1/2	2 1/2
Copper tubes, per lb.....	0 0 9 1/2	2 1/2
Brass tubes, per lb.....	0 0 9	2 1/2
Sheet zinc, best brands, per ton.....	11 10 0	2 1/2
Hard spelter, per ton.....	11 10 0	2 1/2
Soft spelter, per ton.....	12 10 0	2 1/2
Straits tin, per ton.....	110 0 0	2 1/2
English tin, in ingots, per ton.....	113 0 0	2 1/2
Galvanized sheet iron, 18 & 20 g, per ton.....	23 10 0	2 1/2
Galvanized sheet iron, 24 g, per ton.....	24 10 0	2 1/2
Galvanized sheet iron, 26 g, per ton.....	25 10 0	2 1/2
Galvanized sheet iron, 28 g, per ton.....	26 10 0	2 1/2
Gas tubes, Black.....	List prices	70 & 72 1/2
Gas tubes, Galvanized.....	List prices	55 & 57 1/2
Quicksilver, per bottle.....	5 17 6	3
Tin plates, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, per box.....	0 10 6	3
Cube nickel, per lb.....	0 3 6	2 1/2
German silver sheets, per lb.....	0 3 8	2 1/2
Bright iron wire, No. 11, per ton.....	12 10 0	2 1/2
Fencing wire, No. 5, per ton.....	12 10 0	2 1/2
Wire nails, 0 to 7, per cwt.....	0 10 5	2 1/2
Bamboo steel, 1/2 up, per ton.....	12 10 0	2 1/2
Regulus of antimony, per ton.....	15 0 0	2 1/2
Lead, L. B. pig, per ton.....	15 0 0	2 1/2
Lead sheets, per ton.....	15 0 0	2 1/2
Lead pipe, per ton.....	15 0 0	2 1/2
Lead shot, per ton.....	17 10 0	2 1/2
White lead (Genuine dry), per ton.....	19 10 0	5
Red lead (Dry), per ton.....	16 0 0	2 1/2
Iron—Nailrods, per ton.....	7 5 0	2 1/2
Swedish hammered bars, per ton.....	10 5 0	2 1/2
Old boiler plates, per ton.....	4 2 6	2 1/2
Old wire rope, per ton.....	4 2 6	2 1/2
Old horse shoes (packed), per ton.....	5 5 0	2 1/2
Belgian bars, No. 7, per ton.....	15 0 0	2 1/2
Belgian Nailrods, No. 7, per ton.....	15 0 0	2 1/2
Anchor, per cwt.....	0 14 0	2 1/2
Chain, per cwt.....	0 10 6	2 1/2

WILLIAM JESSOP & SONS, LIMITED.

The meeting of the shareholders of this well-known Sheffield steel company last week passed off most pleasantly, there being little room for discontent with a dividend of £9.34 per cent. for the year, free of income tax. Mr. Thomas Jessop, who is growing old, was not able to be present, owing to a cold. Mr. Hall, one of the directors, in seconding a motion for the adoption of the report, said they were no doubt aware that "the present prosperity of the concern was owing to the improved state of trade in America. A few years ago it looked as if the Sheffield manufacturers would never get

a chance again, owing to hostile tariffs, &c., but he was glad to find that the American demand had again revived, particularly for steels of the finest qualities, and Messrs. William Jessop & Sons were able to hold their own." How's that?

SANDERSON BROS. & CO. (LIMITED),

of Sheffield, coupled with the amalgamated firm of Samuel Newbould & Co. (Limited), saw, file, steel, &c., manufacturers, held their annual meeting on Wednesday last. A dividend of 5% was declared upon the English capital of Sanderson Brothers and upon the entire capital of S. Newbould & Co. The balance sheet for Sanderson Bros.' American establishment, at Syracuse, N. Y., was not presented and will not be ready until July. You will remember that Sanderson's took over the works at Syracuse some five or six years ago in order to maintain their American business in steel, files, &c.

FOREIGN.

FRANCE.

(Moniteur des Interests Matériels.)

PARIS, April 2, 1882.—Metals.—Although crop prospects are tolerably good, business is still, to some extent, restricted by the precaution exercised by banks in point of discounts and credits. Metals have been moderately active, while Copper improved slightly. Tin has yielded; Lead is lower, and Spelter tolerably well sustained. We quote: Copper—Chili Bars, 165.50 @ 172.50; Ingots 165.50 @ 172.50; Best selected, 185.50; pure Corcoro Ore, 170.50. Tin—Banca, 227.50; Billiton, 225.50; Straits and Australian, 220.50 and English, 217.50. Lead, 35 @ 37; and Spelter, 45.25 @ 45.75. Iron.—Dealers in the demand for iron are in excess of the current output. They quote Coke, Merchant, at 21.50, and Machine Mixed, at 22.50. Wire of all sorts is doing well in the district. Axle makers in the Haute-Marne basin have raised their prices slightly, and turned ditto to 24. This article had remained backward, and now gradually rises to the level of other goods, the more so as the Chamonix Works have suspended operations in the line. The general outlook in France is reassuring, especially at this center, where an extraordinary amount of building is going on, while all over the country railroad construction will be active. We do not, however, believe in higher prices, but a better feeling in Belgium and Germany lately has cheered up the iron trade in this vicinity. Building this year at Paris will be by entire blocks of houses. Coal.—While Coal for workshops is well upheld in price, that for domestic use is pretty much nominal. The movement is satisfactory in the Loire basin.

BELGIUM.

(Revue Universelle.)

BRUXELLES, April 2, 1882.—Iron.—For the moment our larger works still receive orders enough to keep them busy; it is to be hoped that this may continue so throughout the summer months. The less important concerns, being less favored, sell at times even below 14 francs No. 2. Merchant iron; but this still pays the rolling mills, since they can buy Pig at 6.50 @ 6.75. Prices, though nominally showing no giving way in March, have on the average not ranged as high as in February. We quote to-day, Merchant No. 2, 12.50 @ 14 francs, with a franc difference between numbers; Beams, 15; Corners, 15.50; Sheets No. 2, 12.50; No. 3, 21.50; No. 4, 24.50; Steel Rails, 17.50; ditto Hoops, 23.50, and ditto Axles, 24.50. On taking a general view of the situation, it cannot be denied that there is a good deal of restlessness about the future, which the larger orders for Netherlands India, &c., alluded to in our last, have not been able to dispel. The prospect is not so cheerful as it began to be the previous week. This is to some extent due, perhaps, to less favorable accounts coming from Germany in all March. At any rate, both the rolling mills and blast furnaces, with the exception of a few leading concerns, were glad to see a steadier stream of orders pour in upon them, so as to feel a little surer of the summer season now drawing near, usually the reverse of the spring trade. Spring has been to a considerable extent, a downright failure in Western Europe so far, and this is, of course, also felt in the iron branch, though perhaps less than in many others. The remarkable drought on the Continent has had something to do with this, though less so than the precautions engendered by the January panic. Coal—Is firmer, and there is an improvement of 25 centimes, both in industrial Coal and household. Coke commands 18 francs.

GERMANY.

(Borsenhalle.)

HAMBURG, April 4, 1882.—Iron.—Our Dortmund correspondents express the following effect: "The iron situation may be put down as a highly unsatisfactory one. Complaints multiply, and the consequences of the financial disturbance in January now, after all, make themselves felt more than people were inclined to suppose would be the case in February. The weakness in this vicinity was first inaugurated in the Siegerland; it now even spreads to this district. One thing is certain, &c., that if not soon a turn for the better occurs, the next large contract will be a disaster to the iron trade. The rolling mills, and blast furnaces—existing ones expiring, most of them, on July 1 next—will be at a considerably lower range, the more so as new furnaces continue to sprout from the ground like mushrooms, and overproduction will, in a short time, begin to stare us in the face. The rolling mills now also feel the effect of the uneasy feeling. Few orders are received by them, and as a good many former contracts are backed out of on some plea, a few of them do not feel comfortable, by any means, although they may still have secured work for several months to come. Makers of thin Sheets, in particular, complain of growing dullness, but even Merchant iron begins to degenerate, while for coarse Sheets for boilers and locomotives there continues a good demand; indeed, only quite recently the inquiry for thick Sheets was so urgent that we had to go to Belgium to get part of the orders. A brisk business continues to be transacted in the Steel works, the hardware factories, the axle and car-wheel shops, and the locomotive and car works; in fact, it is railway material which keeps us alive, and we are glad to say that this branch, at least, will not give out in a hurry. Consequently, although the cloud overhanging us is dark, there is a silver lining to it in this respect. Merchant iron maintains its level of 135 marks. Coal.—The tendency is weak all round. In the Moselle and Sarre region, blast furnaces are without interruption busily engaged, but in the rolling mill branch a rather quiet state of affairs begins to prevail. Coal moderately active. In Upper Silesia little transpires on a large scale; the ruinous Friedlander failure makes a bad impression. Puddling Pig is decidedly weaker, but finished iron, especially Sheets, remains firm. Coats dull and dragging. The Upper Silesia Railway Material Co. passes the 1881 dividend. Metals have, on the whole, been dull, but Lead is firmer. We quote: English Pig, 17 @ 17.20; German, 15 @ 16.50; and Spanish, 15 @ 16.40; Copper, quiet and unaltered; Drontheim at 72; Electrolytic, 77 @ 78, and English Refined Ingots, 74 @ 75; Tin is duller at a decline to 116 @ 118. Nothing transpires in Spelter, which we quote 18.25 @ 18.50.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, April 2, 1882.—Iron.—Not much change can be reported for the week. The demand for, and sales of, Merchant iron abated somewhat; at this time of the year it might be more active, but it is expected it will soon pick up again. At the same time Pig iron is less wanted; many consumers thereof had laid in a supply of some magnitude early in the year, they are, therefore, able to hold off, for the moment, until the situation shall have defined itself more clearly for the sum-

mer. Iron importation has been more extensive lately; on the one hand because the revival here encouraged it, and on the other because certain kinds of iron were procured from abroad in advance of the higher duty. So far, activity in the iron and steel branch in Austria-Hungary has been brisk enough to withstand all depressing influences of a similar nature; it will depend on the summer demand whether prices can be further sustained in the face of the weakness which is making headway in Germany. The crop yield among us, if abundant, will materially contribute to sustain the iron situation; so far the prospect is good, but not brilliant. Iron has been quiet, at the ensuing quotations: Common Pig, at the works, 55 @ 56 florins @ ton; Gray ditto, 55 @ 57; Bessemer, 55 @ 59; Merchant iron, at Vienna, 120 @ 125; Bohemian, 110 @ 115; Sheets for locksmiths, 175 @ 185; ditto for roofing, 185 @ 195; for boilers, 175 @ 185; for tanks, 165 @ 170; and Beams, 120 @ 125. Metals—have fluctuated more than the week before; they are steadier at the close: Copper, 80 @ 81 florins @ 100 kg; Tin, 146 @ 150; Lead, 17.50 @ 19; Spelter, 29 @ 32; Antimony, 40, and Nickel, 4.50 @ 5 kg.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, April 1, 1882.—Tin.—The Netherlands Trading Co.'s Banca sale of March 30 averaged 65 1/2 guilders @ 50 kg; the day before the sale, both Banca and Billiton sold at 67 on the spot, and Billiton, July delivery, at 67.75.

CHILI.

(Weber & Co.)

VALPARAISO, Feb. 15, 1882.—Copper.—The continual fluctuations in England have influenced our market comparatively little; there is little offering; at any rate holders are disinclined to submit to the lower parity which the English drop implies. Only after the Chilean rose business was resumed, and 15,500 quintals sold at \$18.25 @ \$18.65, the former figure on shore and the latter on board. Nitrate.—Some 312,000 quintals sold at \$2.45 @ \$2.70 for 55 and 95 %; there remaining little stock on hand on the 1st instant the market righted, but a reaction soon occurred on lower cable quotations from Liverpool. Although the exchange quotations are better now the price remains the same. The Government has issued a decree offering for sale 1,000,000 tons of guano, tenders to be handed in within six months. Half of the proceeds the Peruvian bondholders are to get, the remaining half to accrue to Chili. Nitrate charters have amounted since the beginning of the month to 10,000 tons for Europe, and 400 for the United States.

New England Manufacturers' and Mechanics' Institute.

As has been already announced, the second annual exhibition of this association will take place in their building in Boston, from September 6 until the end of October. Every indication points to a very full and interesting display, even superior to that of last year. We are informed that applications have already been received from several parties for space to exhibit entire processes of manufacture, on the plan of the boot and shoe making exhibit which attracted so much attention last year, and the management expect to make a selection which will be both interesting and instructive. The policy, which has been so successfully carried out, of making an exhibition of mechanical progress and invention, rather than a bazaar, will be continued. The following are the rules governing exhibitors:

Rule 1.—All applications for space shall specify the ground space necessary, in shape and size, the height of each article, the selling price thereof, and the peculiar merit or superiority claimed for it. If, however, the proposed exhibit consists of several articles which ought to be exhibited, and which it is desired to exhibit as one whole, then the whole collection shall be described as if it consisted of and constituted one article only, in which case the price may be omitted.

Rule 2.—No charge will be made for space. Exhibitors must have their goods ready to ship by August 1, 1882. All goods coming by railroad will be delivered directly inside the exhibition building, if consigned to the "Institute Exhibition Building," care of Boston and Providence Railroad Company. Goods so consigned will, unless the consignor informs the superintendent to the contrary, be unloaded from the cars on arrival and placed upon their stands, for which service a reasonable charge will be made.

Rule 3.—The building will be open for the reception of articles, from August 1 until September 1. All articles intended for exhibition shall be properly arranged, ready for exhibition on the evening preceding the first day of opening, or the space therefor shall be forfeited. The exhibition will be open to the public on Wednesday, September 6, and will continue open daily, from 9 o'clock, a. m., to 10 o'clock, p. m., during the entire months of September and October.

Rule 4.—The driving engines must be in operation one week previous to the opening of the exhibition to the public, September 6, 1882, and exhibitors of machinery in motion will be required to have their machinery in running order on the day of opening.

Rule 5.—All pulleys for the main line of shafting must be split pulleys, if furnished by exhibitors, must be accurately balanced, and must have the exhibitor's name plainly marked upon them, and should be received before the 30th of August, to enable them to be put in place on the shaft without unnecessary labor and inconvenience.

Rule 6.—No article on exhibition can be removed from any department during the exposition without written authority; but all appropriate facilities for making sales of articles for delivery at the close of the exhibition, will be afforded.

Rule 7.—An adequate police force will be in attendance upon the premises during the day and night; but all articles on exhibition will be at the risk of the owner. Insurance against loss by fire will be effected, in behalf of all exhibitors, who apply to the treasurer and pay for the same.

Rule 8.—No gas, steam or water pipes, or fixtures, shall be removed, altered, entered or disturbed, without the permission of the superintendent in writing being first obtained; and the superintendent will assess the damage or expense caused thereby, if any, which shall be paid by the exhibitor.

Rule 9.—Permission for the erection of partitions, railings, platforms, &c., must be obtained of the superintendent, who will determine dimensions and conditions.

There is a carpenter's shop, paint shop and pipe-fitting shop in the exhibition building, and work will be done in a satisfactory manner, at reasonable prices, for accommodation of exhibitors. Boxes, packing cases, &c., in which exhibits are received, can be stored in the building during the exhibition.

INDUSTRIAL ITEMS.

MAINE.

The Auburn Foundry Co. have bargained for a piece of land near the Little Androscoggin, and propose to remove their works to that site and run by steam. The plan is to erect large wooden buildings and put in a powerful steam engine. The Tobie & Clark Pump Manufacturing Company propose, also, to build at the same place. The pump business of this concern has grown to very large proportions. They made 2000 pumps last year, and will make 4000 the coming year; 8 and 10 per cent. dividends have been paid on the stock, and the company have a large reserve. A third party also stands ready to build a shop and take power from the Foundry Company.

The fine new foundry and machine shop at Ellsworth, built on the site of Hopkins' Mill, is completed and ready for business.

VERMONT.

The St. Albans Iron and Steel Works, started in 1875, now employ 175 hands, and the capacity of the works is 100 tons of rails per day. An open-grate furnace, making Siemens-Marten steel, is in operation, producing about 25 tons per day. Three-fourths of the steel rolled into rails is imported, the balance being made at the works.

MASSACHUSETTS.

At Cambridgeport, Kendall & Roberts have just completed for the Bay State Gas Co. a 150-horse-power boiler, the fire-box of which is a hydrogen gas generator of the process of the company. This will be set up to furnish power in one of the largest electric light companies in Boston.

The Lowell Card Clothing Co. are adding one machine a month to their capacity from their own machine shop, which is connected with their manufactory. They have furnished clothing for the 360 cards of the Hamilton Mill, just started here.

The Robinson Iron Co. are putting in a fourth furnace in their rolling mill at Plymouth.

CONNECTICUT.

The Southington Cutlery Company have begun the manufacture of razors. The company's other business is flourishing, and the 200 employees are kept busy full time in making all kinds of pocket cutlery.

The Hartford Engineering Company, Hartford, have new orders, which are crowding its works to their full capacity. Orders for their engines to the amount of over \$50,000 have been received within a week.

The "Wringer" manufactory in Middlefield is turning out about 25,000 Universal wringers weekly.

The Corbin Cabinet Lock Company, recently organized, expect to have their new building ready by July 1.

The Simonds Manufacturing Company, of Jersey City, have bought the foundry of S. E. Olmstead & Co., of Newark.

NEW YORK.

The Fletcher Furnace Company were compelled to blow their furnace out on March 30th, on account of the lining having given out. They are relining at present, and expect to blow in early next month.

NEW JERSEY.

Clinton Company, formerly at 1505 Pennsylvania avenue, Philadelphia, Pa., are now located at corner Point and Pearl streets, Camden, and have increased their capacity very considerably. They make a specialty of J. Hammond Gray's patent revolving head screw machine, of which they are the sole manufacturers. They are at present fully employed, and will be for some little time, on orders they have booked. They also anticipate a good demand for their specialties.

Atlantic and Pacific Electric Mfg. Co., Camden, have increased their facilities by the addition of a large planer and several other special tools. They have lately given an order for a 36-inch boring mill. Since the company was formed last summer they have been kept busy to the full extent of their capacity, and will be during the remainder of this year, on orders which they have on their books for 150 to 200 lamps. They are about to introduce a novel and patent electric lamp post.

PENNSYLVANIA.

The H. B. Smith Machine Company are enlarging their store, 92 Market street, Philadelphia, making it 200 feet deep, to accommodate their large stock of woodworking machinery and machinists' tools.

Riehle Bros. report business brisk, particularly under their patented and improved scales and testing machines. They are making a large testing machine for the Japanese Government, a 40-ton track scale for Stickney Iron Co., a 50-ton track scale and also other scales for the Pennsylvania Bolt and Nut Works. Charging scales have recently been delivered to the Akron Iron Company, Messrs. More & Marshall, New Straitsville, Ohio; Boyce, Wheeler & Co., West Middlesex, Pa.; Logan Iron Co., Logan, Pa.; Parrott Iron Works, New York; Gern Iron and Mining Co., Port Leyden, N. Y.; also the smaller scales in great variety.

Messrs. A. N. Downes & Co., New England Machinery and Boiler Depot, Philadelphia, whose works are situated at Lebanon, have been kept busy for some time past, and have a good many orders on their books which will keep them busy for some time to come. They make a specialty of boilers and also a belt pump and heater.

The Taylor Manufacturing Company, of Chambersburg, which propose to build locomotives, has been chartered, capital stock \$150,000; also the Wyoming Valley Coal Company, with a capital stock of \$1,200,000. The principal office is at Wilkesbarre.

The Lehigh Iron Company are having stack No. 1 filled, and it will be put in blast immediately. This furnace has undergone extensive repairs since going out of blast about 10 weeks ago. It has been rebuilt and overhauled from top to bottom.

It is reported that a new company has been organized in Spring City to manufacture stoves, the Keeley Works having been sold and removed.

At the Mellert Foundry and Machine Company, Reading, there is being manufactured

at the present time, for the city of Philadelphia, from 5 to 10 tons a day of water pipe having diameters of 36 inches, 30 inches and 6 inches, respectively. From 4000 to 5000 tons of this pipe have been made at this establishment during this season. Some 12 tons of the pipe will be shipped to its destination, 97 tons of the largest diameters having been already shipped. The contract will not be filled for several months yet. Mr. Thos. S. Baker, of Philadelphia, is the inspector at present stationed here. Three or four other foundries in other parts of the county are also engaged in manufacturing pipe for the same parties.

Samuel J. Creswell, of Philadelphia, has been awarded the contract for the cast-iron work of the Lehigh Valley Railroad offices, at Mauch Chunk, and the large iron porticoes for the Swarthmore College, Delaware County, Pa.; also the stable fittings for the West Philadelphia and Lombard and South Street P. R. W. Co., in Philadelphia.

Stokes & Parrish, of Philadelphia, have recently taken an order from the Philadelphia and Reading Coal and Iron Company for a new furnace hoist for the Swede furnace. They have also taken a similar order from the Shenandoah Iron Company, for their furnace at Shenandoah, W. Va. They are very busy on hydraulic hoists, both freight and passenger, putting in three at the new building of R. D. Wood & Co., Fourth and Chestnut streets, besides numerous others in Philadelphia, as well as in Western and Southern cities.

PITTSBURGH AND VICINITY.

The iron works of Graff, Bennett & Co., at Millvale, are nearly ready to be operated in every department. The puddlers will resume work next Monday, and in the near future the entire force (667 men) will again be employed.

We hear that the Edgar Thomson Steel Works Co. have decided to build two additional furnaces, making seven in all. Manager Wm. R. Jones has withdrawn his resignation.

Thomas Coffin & Co. are shipping brick for W. Eliot Smith's new 14-pot Gill gas furnace, at Alton, Ill. This furnace will be for white prescription goods. Mr. Smith has three other open-pot furnaces, but this is the first gas furnace in his factory.

The Murrysville gas well has been sold to J. C. Polly, agent for a New York syndicate, for \$20,000. The new owners state that they purpose utilizing the gas at the Edgar Thomson Steel Works and the National Tube Works, and to this end have organized a company with a capital stock of \$500,000.

Witherow & Gordon are erecting three new hot-blast stoves for the No. 2 stack of the Isabella Furnace Company. The stoves are each 21 feet in diameter and 70 feet high, and will together contain 900,000 ft. of brick, and probably about 200 tons of iron. The expense incurred in erecting such stoves by the Furnace Company will be great, but is undoubtedly justified when the results produced by a similar remodeling of the equipment of the No. 1 stack is considered. This stack made, with the new stoves which Messrs. Witherow & Gordon furnished, 7321 gross tons in the six weeks ending April 1st. For the week ending at that time she made 1282 tons, and on March 30th and 31st, 24 hours, she made, respectively, 215 tons and 217 1/2 tons. This product was made on 1.08 pounds of coke



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LIST PRICES.

No. 10—14-inch Sweep, per dozen...\$33.00	No. 14—6-inch Sweep, per dozen...\$21.00
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No. 12—10-inch Sweep, per dozen... 27.00	No. 32—10-inch Sweep, per dozen... 36.00
No. 13—8-inch Sweep, per dozen... 24.00	No. 33—8-inch Sweep, per dozen... 33.00

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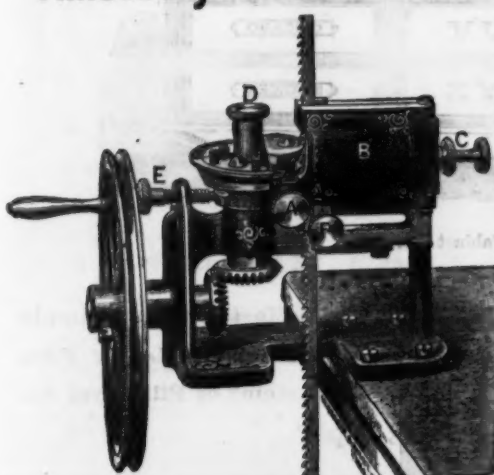
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Any boy that can turn a crank can file a band saw in from five to ten minutes more accurately than an expert filer can do the same by hand in one hour. Keeps the teeth even and level, and enables the saw to do more and better work with much less strain. Pronounced by users to be the best labor-saving machine ever introduced.

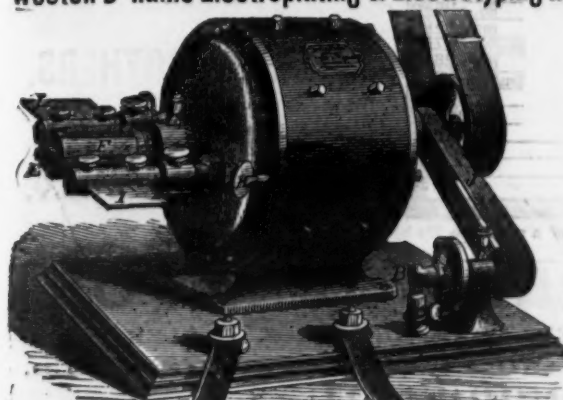
First Premium and Diploma of St. Louis Agricultural and Mechanical Association, 1881, awarded for

BEST BAND SAW FILING MACHINE.

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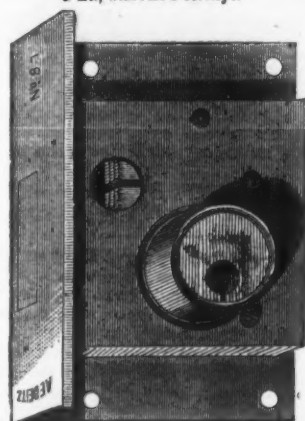
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FOR WATER AND GAS,

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order for turbine water wheels, iron turbine wind engines and Buckeye force pumps, from Adelaide, South Australia, and are at this time preparing to fill a large order for same kinds of goods for Christ Church, New Zealand. Their trade in Europe and other foreign ports is rapidly increasing. The business of this company has doubled in the past year, and larger extension of capacity of their works is anticipated in the near future.

Messrs. John H. McGowan Mfg. Co., of Cincinnati, have just filled several large orders for tobacco machines, shipped to several points West and South, and to Australia. Their works are running to their full capacity upon tobacco machines and "Rival" pumps of various sizes. The business of this company has more than doubled in the past 12 months, and a very heavy business is expected this year.

Mr. Charles Gooch, manufacturer of ice-cream freezers, Cincinnati, has just returned from a business trip, and brings with him some large orders for his goods. He is turning out from 350 to 400 freezers per day, and expects this season to largely increase these figures. He is shipping to all parts of the United States and Canada. Mr. Gooch's bill for castings for freezers of all sizes is a large item in the cost of his productions. These castings are made at the works of Messrs. Sohn & Reutsehler, of Hamilton, Ohio.

The American Revolving Screw and Bolt Case Company, at Dayton, are enlarging their business rapidly. They are making several sizes of these cases, suitable for retail trade or for machinists' use. The base or lower tiers of drawers are made large enough for 6 to 10 inch bolts, and the upper tiers are suitable for all sizes of screws. The case is octagonal, or otherwise, and sits perpendicularly, revolving on a strong pivot. The drawers are arranged around the body of the cylinder. The face or front of each drawer is numbered for certain sizes of screws. For retailers of hardware they are very convenient, as all the numbers are brought in sight by turning the case upon its pivot.

The Tricycle Manufacturing Company, at Springfield, are preparing to place some new and very attractive goods upon the market this season, among which we may mention their children's tricycles and wheelbarrows, also farm and railroad barrows of superior quality of workmanship and material.

The business of the Lechner Mining-Machine Company, at Columbus, is gradually increasing. They are manufacturing chains of very superior quality, for use in place of leather belting, and have some good orders, which they are filling as rapidly as possible. Their mining machine is looked upon as a very valuable invention, and they expect large orders for them this year.

ILLINOIS.

The Crane Bros. Mfg. Co. have established mills in Chicago for the manufacture of lap-welded wrought-iron pipe.

A new sheet mill has been erected by the Illinois Zinc Company, at Peru, which has a capacity of 30,000 pounds per day. They will employ 100 hands.

The National Wire Company have organized in Chicago to manufacture a four point barb wire, and are now ready for business.

The Pattee Flow Co., of Monmouth, are making a number of improvements at their works, which will cost, in all, about \$20,000. They include an addition to their foundry, and the erection of a new pattern shop and four warehouses.

MISSOURI.

One of the shops of the Groom Shovel Company, of St. Louis, was partially destroyed by fire on the night of the 12th. They at once commenced repairs, and expect to be in running order very shortly.

Two of the Missouri furnaces have been out for some time. They are now repairing and expect to blow in as soon as they are ready.

The Lindell Glass Company are building a large addition to their works.

Chouteau, Harrison & Vallé are running their Laclede mills double turn. Their payroll numbers over 600.

ALABAMA.

The hot-blast stoves for the Woodward Iron Company, referred to in a recent issue, are being built by Messrs. Witherow & Gordon, of Pittsburgh, Pa. The latter firm also have orders for three stoves for the Eureka Iron Company, at Oxmoor, and three for the Sloss Furnace Company, at Birmingham.

KENTUCKY.

Ashland Furnace is making 400 tons of iron per week, and is using phosphor-bronze tuyeres, which are giving great satisfaction.

KANSAS.

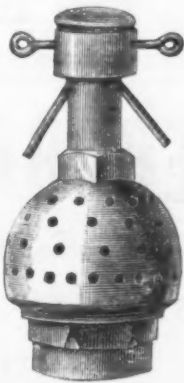
The Fort Scott Foundry and Machine Works have nearly 100 hands employed, and are adding new and improved machinery. They are now building concentration works of 50 tons per day capacity for the Hecla Consolidated Silver Mining Company, at Glendale, Montana.

An Improved Automatic Fire Alarm and Fire Extinguisher.

Mr. John W. Smith, of Brooklyn, who has had over 25 years' experience as a practical fireman in the New York and Brooklyn departments, some time since invented and received a patent for an automatic fire alarm and fire extinguisher, which we here illustrate. The engraving represents one of a series of perforated chambers to be connected with supply pipes passing through each floor of a building. These chambers are provided with plugs, which prevent the water from entering, and which rest against a cartridge receptacle placed at the top of each chamber.

Each receptacle, besides containing a light cartridge connected with a fuse, is provided with a non-conducting ring, to which two half round metallic plates, with a metallic plug between, are attached, thus forming a complete electrical circuit. The circuit wires are designed to be connected with an alarm placed in the office or engine room of a factory, or in any place where it may be readily heard. Should a fire occur in the vicinity of the apparatus, a piece of raw cotton on the fuse would be ignited, ulti-

mately causing the explosion of the cartridge. The force of the explosion will remove the metallic plug at the top of the apparatus, thus breaking the circuit and immediately sounding the alarm. At the same time the plug in the interior of the chamber having nothing to rest against, from the fact that the cartridge has exploded, is forced into the cartridge receptacle and allows a free opening for the water to flow out and extinguish the fire. When there is not sufficient water pressure to do this, a tank may be placed on the top of the building or a pump may be connected with the water pipes, forcing the water through the chamber in the immediate vicinity of the fire, the others remaining closed. By means of a suitably placed valve, the flow of water may be stopped when desired, and the usual damage resulting from an excess of water may be wholly avoided. The apparatus seems to be



specially adapted for use in buildings located outside of city limits where there are no fire departments. A building 25 x 100 feet should have about 14 of these extinguishers on each floor, and we are informed that the complete outfit per floor, including electrical alarms, &c., would not exceed \$100. Mr. Smith's apparatus has been subjected to repeated tests which have in every case given highly gratifying results, and it will probably not be long before its peculiar advantages will be recognized and appreciated by the public, causing its more general introduction.

Puddlers Wages at Pittsburgh.

In the Pittsburgh Commercial Gazette of the 12th a correspondent, over the signature of "Union," urges that puddlers were poorly paid, and that the meeting of the puddler's committee, which convened in Pittsburgh last Saturday, should demand additional wages. The correspondent said:

"It is an admitted fact in every iron district in this country that the puddlers perform more hard work than any other class of skilled workmen employed in a rolling mill, and for their services receive less pay. And also it is an undeniable fact that the rollers, heaters and other workmen of the mill receive almost as much pay for their labor as three puddlers. I ask in the name of justice and humanity if this is right? Should this be permitted to go on unchecked? I appeal to any honorable, unselfish member of our organization to answer this question, yes or no. We say 'No.' The puddlers are forced to work miserable iron—compelled to do the work which the blast furnaces should do. It is quantity, not quality, that these furnace masters push into market. The puddler is the sufferer. Forced to do this extra hard work, we claim we are entitled to be better paid than we now are for our services. Year after year the iron appears to be getting worse. No two men in Christendom can work this iron in the summer months. To do ourselves justice and make a good quality of iron we should have a sufficient advance in our scale to pay the third man. We ask that the wages of skilled workmen be better equalized, so that all will fare alike, and put a check to a few receiving the lion's share. We claim on account of the amount of slavish work a puddler performs—hard iron, fixing, &c., taken into consideration—that the puddlers' scale should be separate from all others, and have no connection whatever in the formation of scales for other branches of labor. Let every tub stand on its own bottom. Puddlers to the rescue. Strike while the iron is hot. This is your last opportunity for one year. Don't allow yourselves to be hoodwinked, intimidated or frightened. Demand what is justly your own and submit to injustice no longer."

This letter caused considerable of a commotion among the workmen in Pittsburgh. At first it was contended that the writer was not a member of the Association, but as he was of the Society of the Amalgamated, Mr. Martin, who is not a puddler, but a roller, we believe, answered it in the Labor Tribune. After giving the letter he says: "The above was published in the Commercial Gazette on Tuesday last, and instead of promulgating the principles and motto that our society inculcates (united we stand), it will have a tendency to play upon the weaker minds and engender hatred and eventuate in demoralization, and finally reach the point anxiously desired by our enemies—'divided we fall.'"

"In his article, which we are safe in saying is by no means the sentiment of our good puddler members, 'Union' allows his communistic ideas to crop out, inasmuch as he wants to get an advance at the expense of brother members who happen to be heaters and rollers. It shows a narrow, selfish and morbid greediness that does not exist in a true union man. It shows a disposition to bring about a 'leveling day,' at whose expense he cares not so he gets a share of the spoils. It shows an utter disregard for the welfare of the Amalgamated Association (of which he claims to be a member), and which, by a combined front of puddlers, heaters, rollers, &c., got him what he otherwise could not have gotten—an advance from \$5 to \$5.50 per ton for puddling, and prevented a reduction being imposed upon him of from \$5 to \$4.50 per ton. It would seem that he is destined to be a puddler (and a very jealous one at that), or he would emerge from his occupation and aspire for one of those he seems to envy, heating or rolling. He would not then 'ask that the wages of skilled work-

men be better equalized.' Such 'union' men as he, if they had the reins, would be the means of all the members getting an advance downwards for want of unity."

It will be noticed that Mr. Martin does not discuss the letter on the merits of the claim, which really are that the puddler does not, relatively to the amount and laboriousness of the work he does, get as good wages as the heater and roller. This is another example, however, that occasionally crops out of the internal dissensions that exist in the Amalgamated.

LABOR AND WAGES.

Five glass-blowers at Tibby Brothers' factory, at Sharpsburg, Pa., who struck a few months ago on account of the employment of non-union men, have resumed work and forfeited their membership in the union.

Last Tuesday there was a meeting of the Pittsburgh, Wheeling and vicinity nail-plate rollers held in this city, for the purpose of fixing a scale to be presented the 1st of June. The Pittsburgh papers intimated that an advance of from 63 to 70 cents would be demanded. The members of this branch of the trade were very reticent the day of the meeting, and would venture no information. Last night a gentleman defined the situation as follows: Heretofore the Pittsburgh price has been 63 cents and the Wheeling price 50 cents, while muck rolling, nailing, and, in fact, all the other branches of the trade have paid in Wheeling as much, and in some cases a little more. The meeting of the rollers was for the purpose of making the price uniform in both cities.—Wheeling Intelligence.

The drag-outs employed at Chess, Cook & Co.'s nail mill, Pittsburgh, have struck for an increase of 25 cents per day. They have been receiving \$1.75 per day.

About two weeks ago the heaters at the scrap furnace in the Clinton Mill, Pittsburgh, asked the firm to give them two helpers, one for the night turn and the other for the day turn. The proprietors refused the request and the heaters struck. A compromise has been effected, by the firm allowing the heaters to employ two heaters, the heaters to pay one-half of their wages and the company to pay the other half.

The hook-ups, drag-downs and straighteners at the bar mill in Clinton Iron Works, Pittsburgh, who struck for an advance of wages about two weeks ago, are still out. They were paid by the day (\$1.65), but they want to be paid by the ton. It has been rumored that this strike was ordered by the Amalgamated Association, but Mr. John Kelley, one of the vice-presidents of the association, states that the strikers do not belong to the association, and, of course, have no claim whatever on it. The strikers want to be paid 16 cents a ton.

Some 40 of the striking miners at Banks-ville, near Pittsburgh, recently left the city for England. They had been in this country only a short time, and had become homesick and wanted to get back to the mother country.

The laborers in the Clinton Mill, Pittsburgh, who heretofore have been required to work 11 hours a day, asked the proprietors to reduce their time to 10 hours. The men threatened to strike if their request was not complied with. The proprietors acceded to the demands of the men and they went to work.

The fillers employed at the blast furnaces about Wheeling are demanding an advance. At present \$1.75 per day is the figure, but \$1.90 is wanted.

A committee of nailers met in Wheeling and adopted a schedule of "lengths and weights" to be applied to their scale. Some other necessary alterations were made in the scale, and the same will be submitted to the manufacturers.

Merchants who trade with Mexico will be glad to hear that Mr. Warner P. Sutton, United States Consul at Matamoros, has prepared and forwarded to the State Department an accurate and conveniently arranged translation of the Mexican tariff laws and rates of duty, with the forms in which all Mexican custom-house papers must be made out. This is likely to be one of the most useful of the series of consular reports projected by Secretary Evarts.

It is stated that the village Fattan, in Switzerland, is being gradually swallowed by the ancient moraine on which it is built. The phenomenon is ascribed to the movement of underground waters, and it seems quite probable that the perils may be avoided by certain engineering operations which are to be commenced in a short time.

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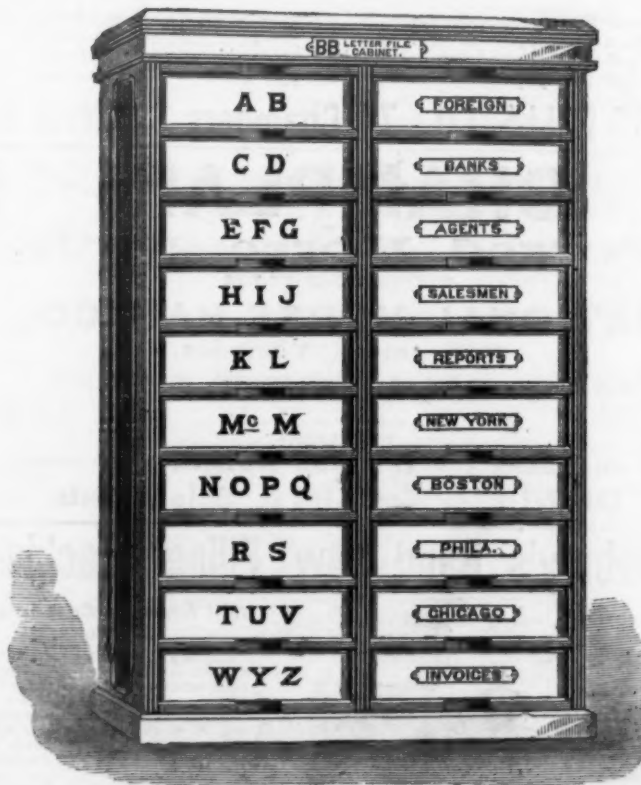
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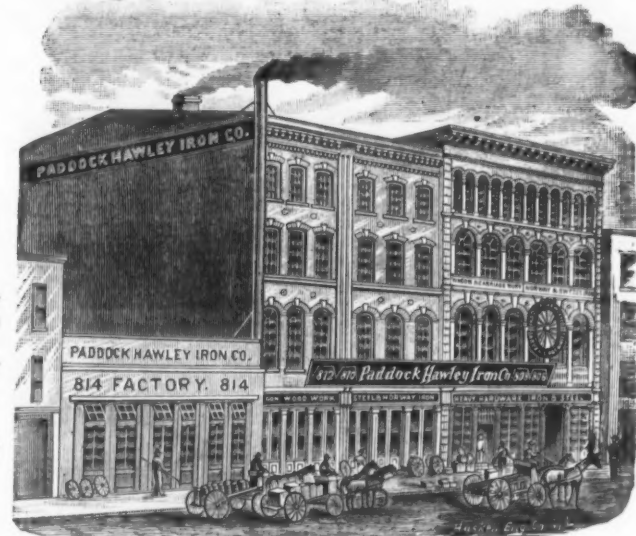
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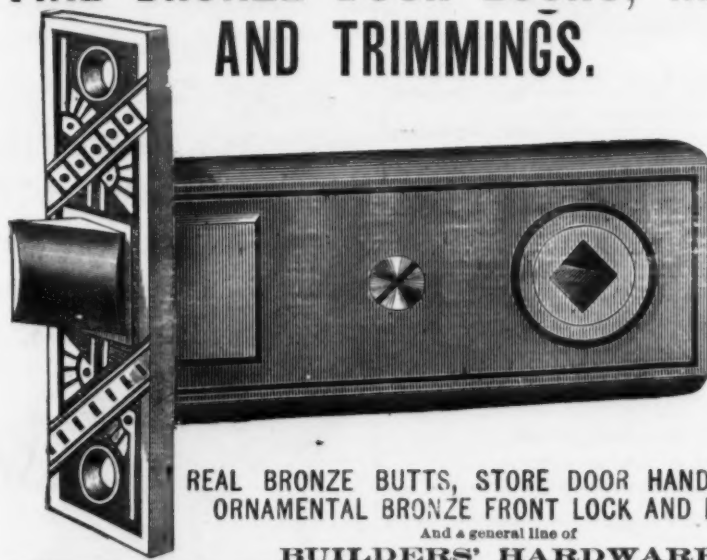
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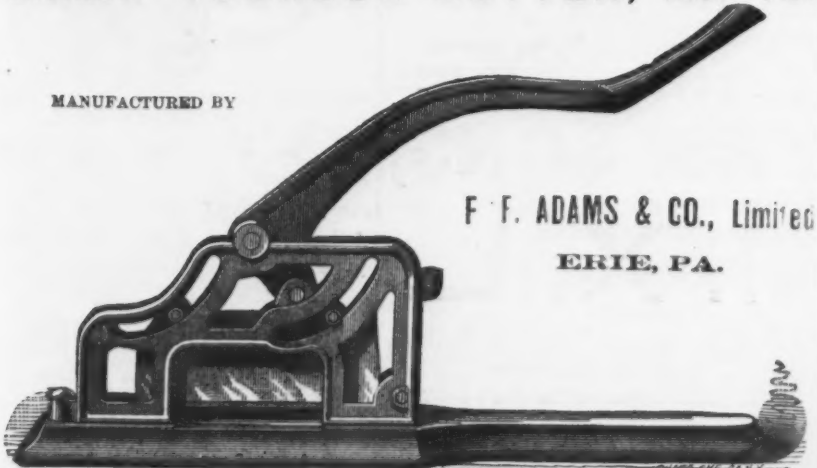
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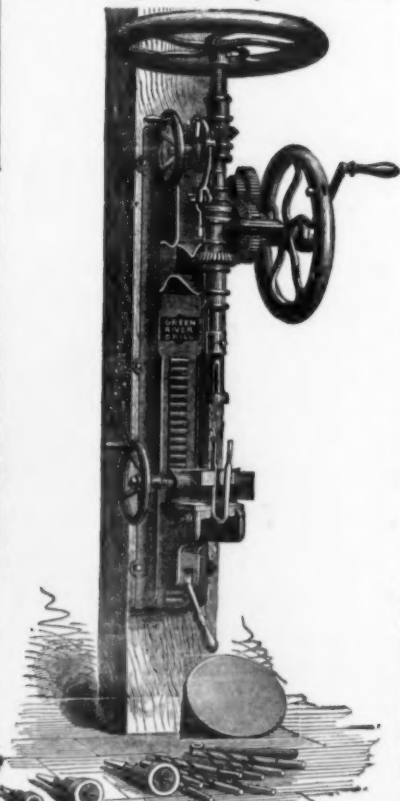
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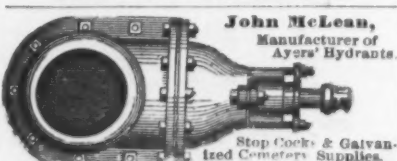
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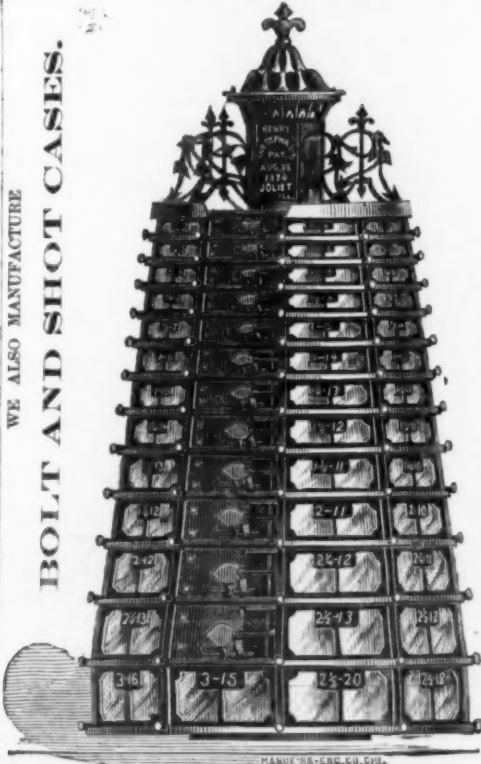
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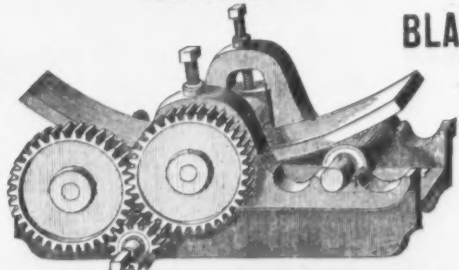
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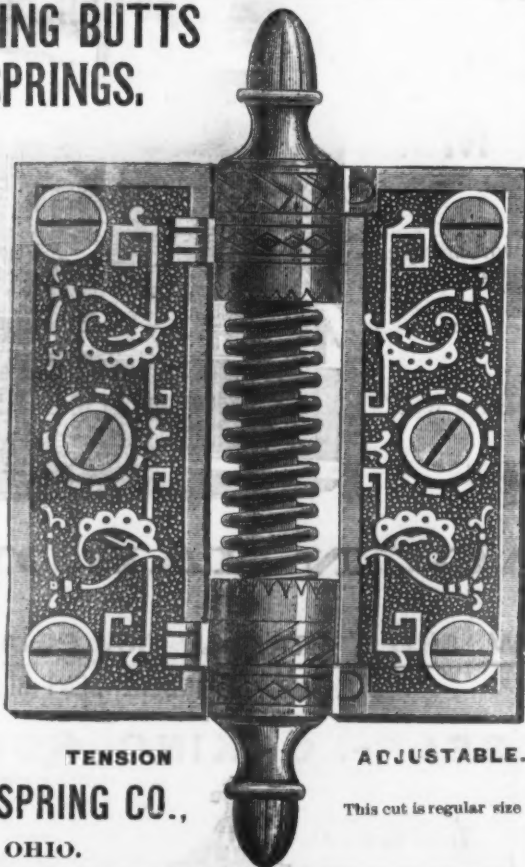
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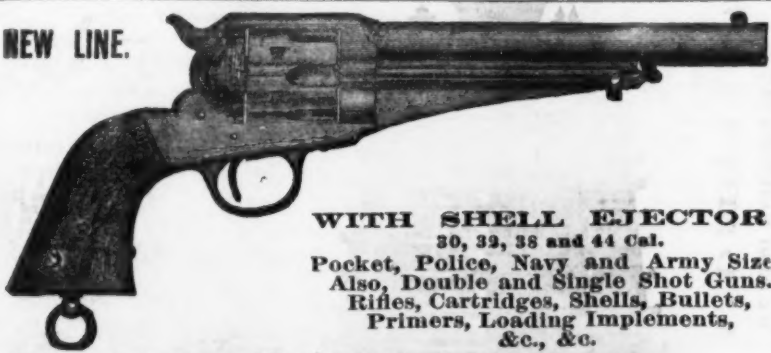
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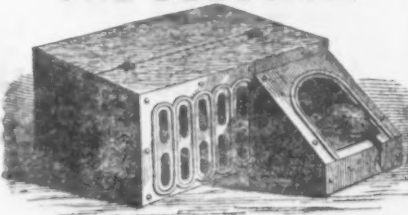
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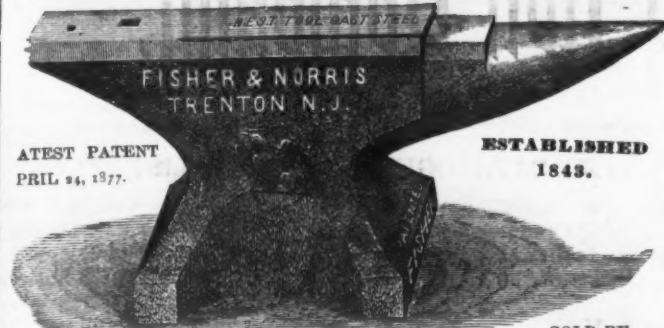
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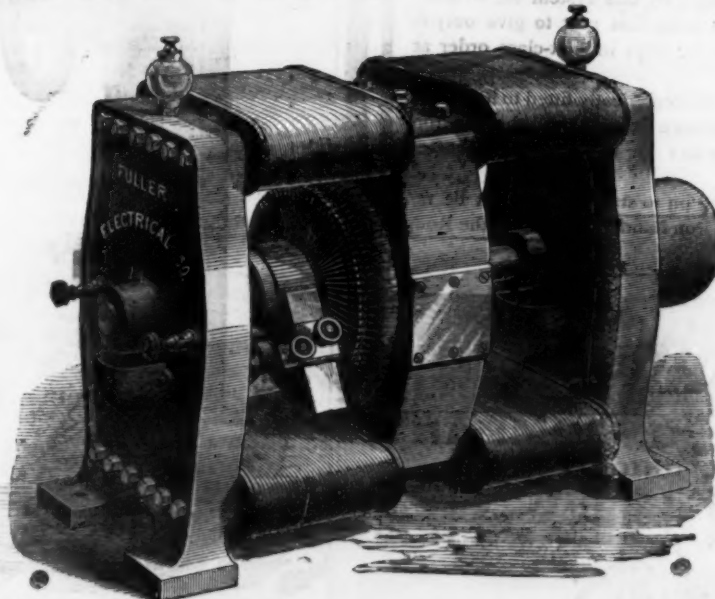


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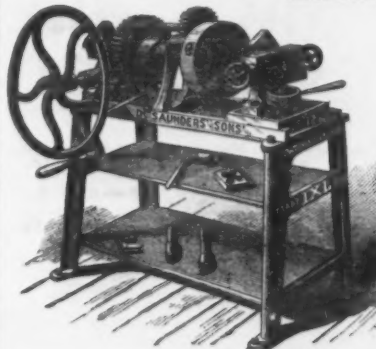
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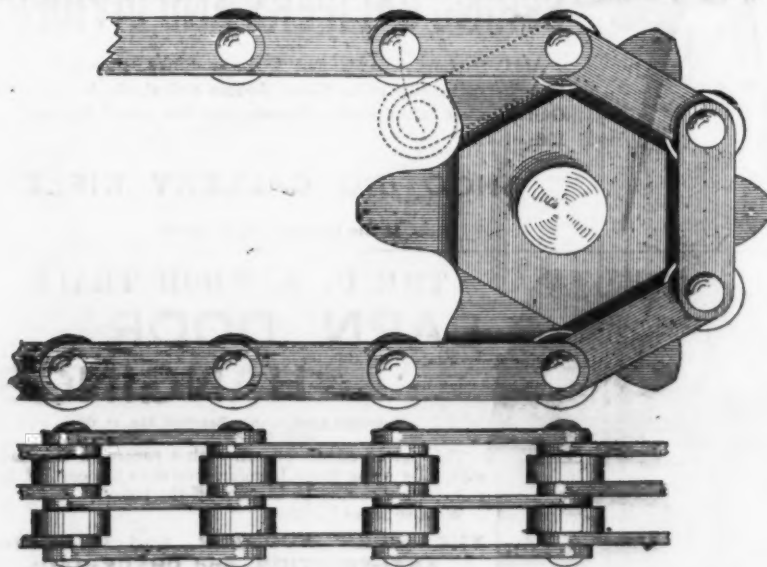
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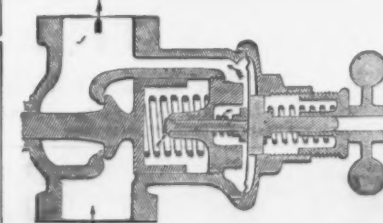
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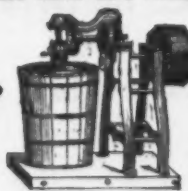
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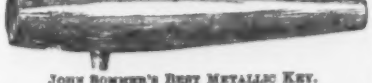
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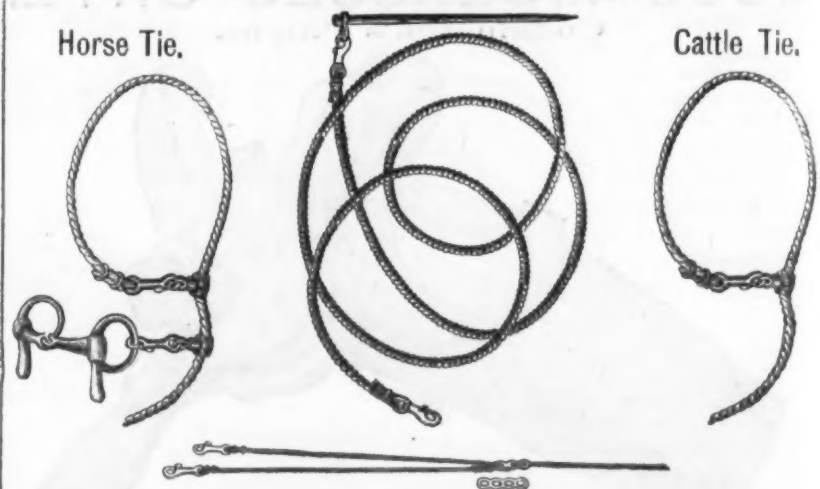
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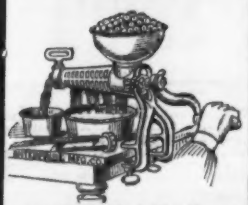
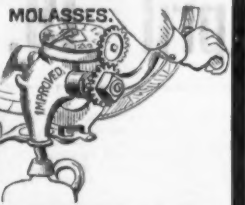

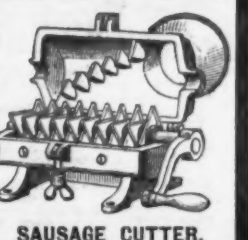
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ADAPTED TO ALL KINDS OF VISE WORK. ALSO
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Leather.....		dis 40 50
Brass.....		dis 40 50
Doors.		dis 40 50
Door Springs.		
Torrey's Rod, regular size, per doz \$3.....		dis 10 20 50
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Bee Rod.....		dis 15 50
Knair's Rod.....		dis 15 50
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No. 1, Large, Japanese.....	¢ doz \$2.00	
No. 2, Small, Japanese.....	¢ doz 2.00	
Star (Coil) For Cop'd Nickel-Plated, etc., list.....		dis 15 50
No. 4, Extra Fly Screen door size, 8 doz.....		dis 15 50
No. 5, Screen Door Size.....	¢ doz 2.00	
No. 6, Medium.....	¢ doz 2.75	50 50
Sabin's Lovers..... No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....		dis 15 50
Sabin's Crown.....	¢ doz 1.50	
Philadelphia.....	in, 5¢; 10¢; 15¢; 20¢; 25¢; 30¢; 35¢; 40¢; 45¢; 50¢; 55¢; 60¢; 65¢; 70¢; 75¢; 80¢; 85¢; 90¢; 95¢; 1.00; 1.05; 1.10; 1.15; 1.20; 1.25; 1.30; 1.35; 1.40; 1.45; 1.50; 1.55; 1.60; 1.65; 1.70; 1.75; 1.80; 1.85; 1.90; 1.95; 2.00; 2.05; 2.10; 2.15; 2.20; 2.25; 2.30; 2.35; 2.40; 2.45; 2.50; 2.55; 2.60; 2.65; 2.70; 2.75; 2.80; 2.85; 2.90; 2.95; 3.00; 3.05; 3.10; 3.15; 3.20; 3.25; 3.30; 3.35; 3.40; 3.45; 3.50; 3.55; 3.60; 3.65; 3.70; 3.75; 3.80; 3.85; 3.90; 3.95; 4.00; 4.05; 4.10; 4.15; 4.20; 4.25; 4.30; 4.35; 4.40; 4.45; 4.50; 4.55; 4.60; 4.65; 4.70; 4.75; 4.80; 4.85; 4.90; 4.95; 5.00; 5.05; 5.10; 5.15; 5.20; 5.25; 5.30; 5.35; 5.40; 5.45; 5.50; 5.55; 5.60; 5.65; 5.70; 5.75; 5.80; 5.85; 5.90; 5.95; 6.00; 6.05; 6.10; 6.15; 6.20; 6.25; 6.30; 6.35; 6.40; 6.45; 6.50; 6.55; 6.60; 6.65; 6.70; 6.75; 6.80; 6.85; 6.90; 6.95; 7.00; 7.05; 7.10; 7.15; 7.20; 7.25; 7.30; 7.35; 7.40; 7.45; 7.50; 7.55; 7.60; 7.65; 7.70; 7.75; 7.80; 7.85; 7.90; 7.95; 8.00; 8.05; 8.10; 8.15; 8.20; 8.25; 8.30; 8.35; 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Dinner Frames, by case.....	dls 70 s
Less than a case.....	dls 68 10 s
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Ferris & Taylor.....	dls 60 10 s
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Pan Steel, Silver Plated.....	dls 33 10 s
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(In P. S. W. Table.....	\$25 s gross net
In (Cowles Hdw. Co.).....	dls 10 s
Sticks and Dies.....	dls 10 s
Lighting "Screw Plate.....	dls 10 s
Stone.....	dls 10 s
Hindustan No. 1, 6x Ax, 8c.....	gross \$200, dls 10 s
No. 2, 6x Ax, 8c.....	gross \$200, dls 10 s
Sand Stone.....	£ 6 c, dls 30 10 s
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Washita Stone.....	No. 2, £ 160 n
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Kansas Oil Stone No. 1, 4 to 6 in.....	\$1.35 per lb.
Turkey Oil Stone No. 2, 6 to 9 in.....	\$2.20 net
Turkey Oil Stone (Chase).....	\$2.40 dls 10 s
Lake Superior Siliceous (Chase).....	\$2.40 dls 10 s
Jirindontos, Family, Loring's.....	\$2.40 dls 10 s
Stone Polish.....	gross \$200, dls 10 s
Dem.....	gross \$250, dls 10 s
Metal Medals.....	gross \$200, dls 25 s
Ruby.....	gross \$250, dls 10 s
Living Sun.....	gross \$75, net
Dixon's Plumage.....	£ 8 c, net
Straws.....	dls 5 s; full cases, dls 50 s
Iron.....	dls 5 s; full cases, dls 50 s
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Winterbottom's Try Square and T Bevels.....	dls 20 10 s
Try Square and T Bevels.....	dls 20 10 s
Brands, &c.....	dls 20 10 s
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Tinned American Tacks.....	dls 40 s
Copper Tacks and Nails.....	gross \$100, dls 35 s
Swedish Hungarian Nails.....	dls 30 10 s
Swedish Hungarian Nails.....	dls 30 10 s
Swedish Hungarian Nails.....	dls 30 10 s
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Thermometers.....	dls 20 s
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Read's Brick and Plastering.....	dls 25 s
Reid's Brick and Plastering.....	dls 25 s
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Clement & Maynard's.....	dls 25 s
Rose's Brick.....	dls 25 s
Worral's Brick and Plastering.....	dls 25 s
Garden.....	dls 25 s
Triers.....	dls 25 s
Butter & Cheese.....	dls 25 s
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Vises.....	dls 25 s
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Solid, Wilkinson's.....	150 s
Parallel, Parker's.....	130 s
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Parallel, Merrill's.....	dls 35 10 s
Parallel, Sargent's.....	dls 35 10 s
Parallel, Oval Slide.....	dls 40 s
Parallel, Double Screw Lock.....	dls 35 10 s
Parallel, Prestinit.....	dls 35 s
Parallel, Adjustable.....	dls 35 s
Family Lat.....	net
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Saw Filers, Hopkins'.....	£ doz \$120, dls 20 10 s
Reading.....	dls 40 10 s
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Johnson's.....	£ doz \$100, dls 25 s
Penny's.....	£ doz \$100 and \$150, dls 25 s
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Bright and Annealed.....	Nos. 10, 12, dls 50 s
Bright and Annealed.....	Nos. 10, 12, dls 50 s
Coppered.....	Nos. 8, 10, 12, dls 40 s
Galvanized.....	market lat, dls 40 10 s
Cast Steel.....	dls 20 s
Turned Brass Wire, Nos. 18 to 25.....	dls 25 s
Annealed Brass Wire, Nos. 10 to 14.....	dls 20 s
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Galvanized Telegraph, Nos. 10 to 12.....	dls 20 s
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Fig. 1.

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NO CLOGGING.

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DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.



Fig. 2.

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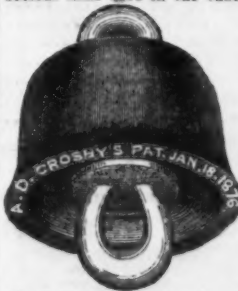
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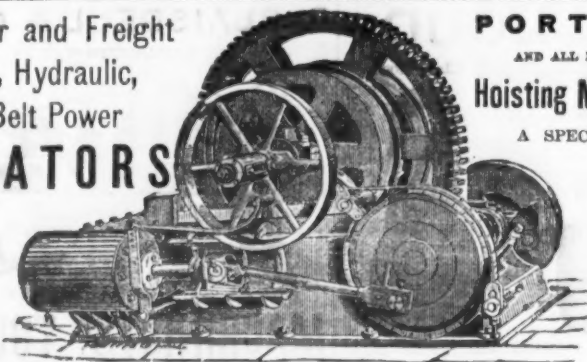
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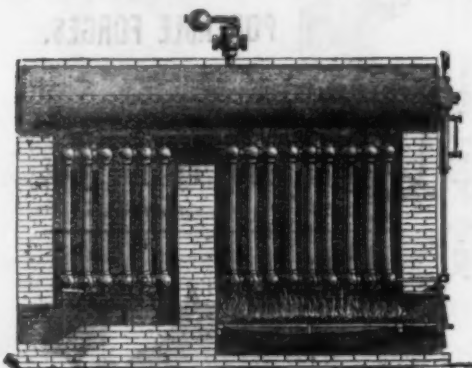
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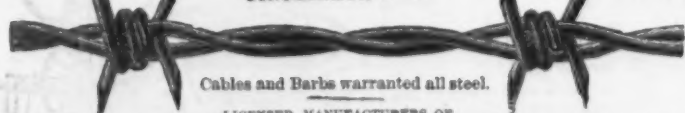
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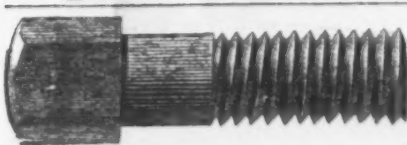
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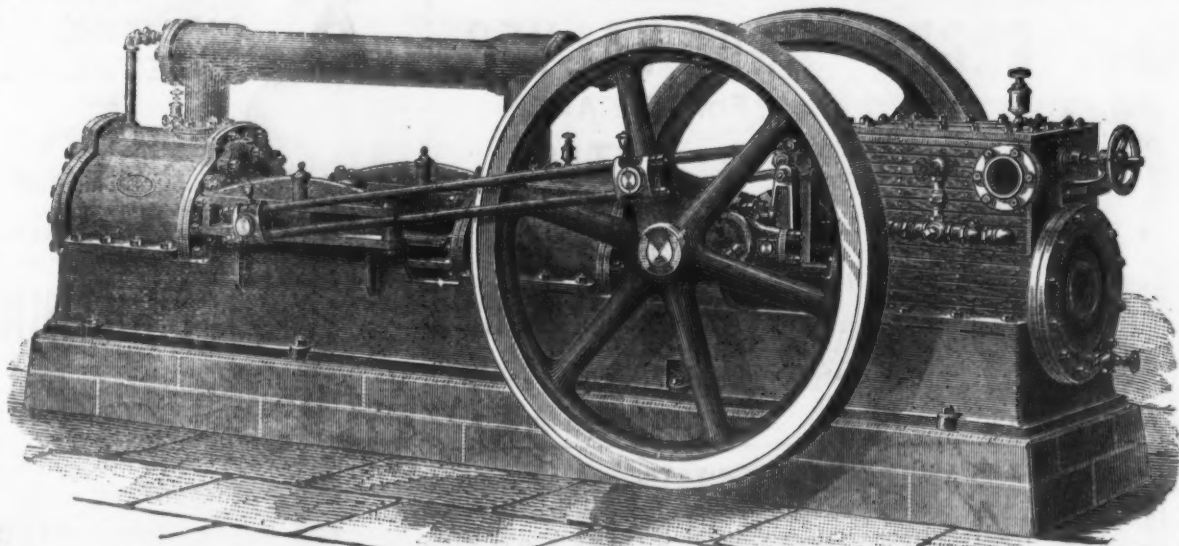


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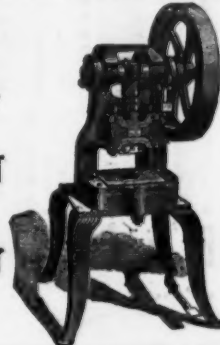


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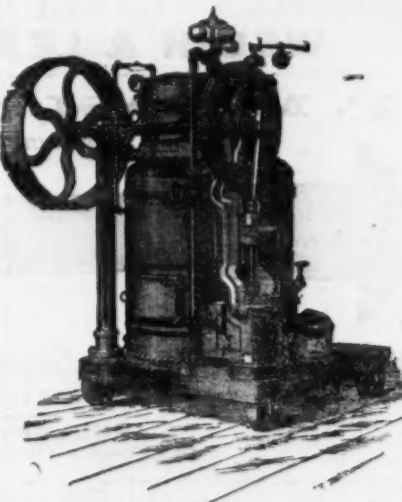
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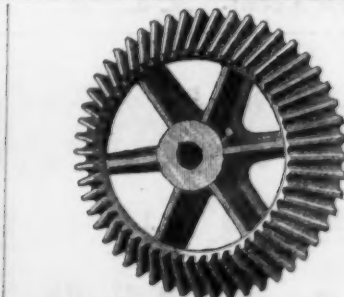
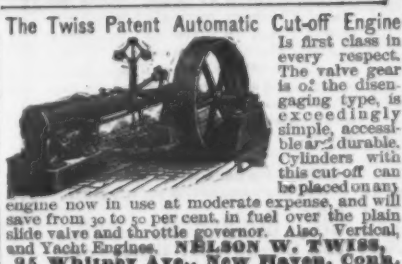
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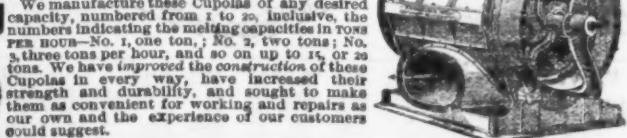
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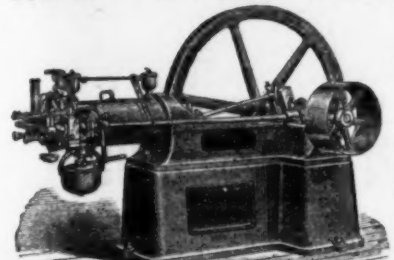
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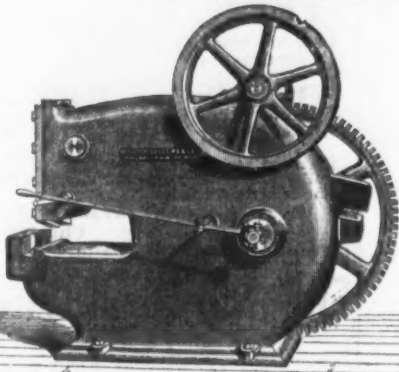
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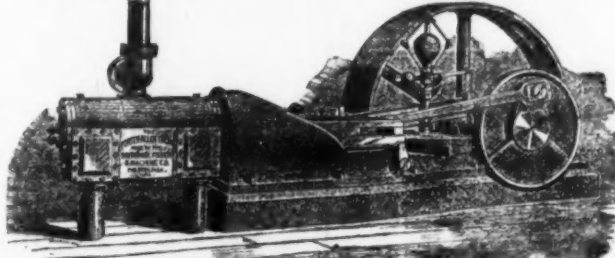
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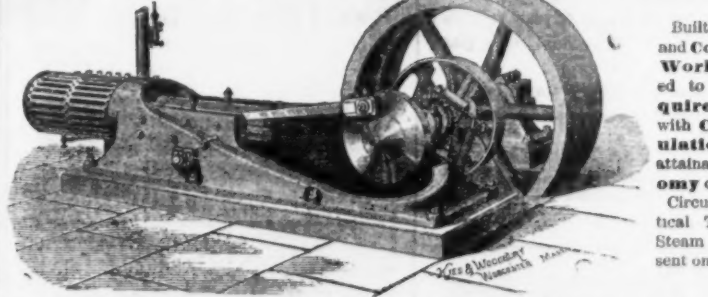
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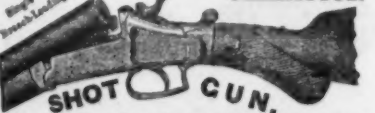
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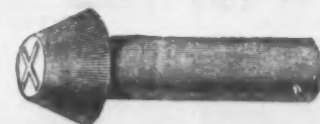
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